TABLE OF CONTENTS

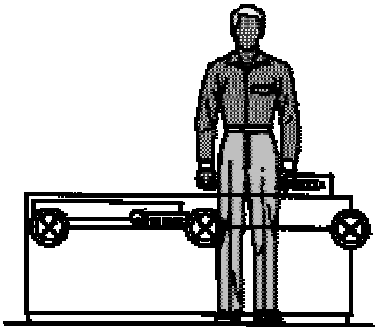
Welcome to Ergonomics

1

Ergonomics - What is it?

Design Error

Most people look like this...



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Industrial interest of ergonomics began in the late fifties and early sixties when industrial engineers began to try and determine the measurements of the worker the machinery was originally designed around.

The example above is a common model of wood lathe that was evaluated in the early sixties. Standing beside the lathe is an average height.

How comfortable does this task look to you?

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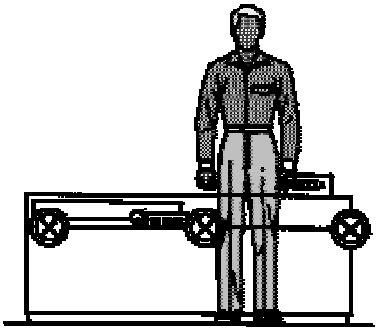
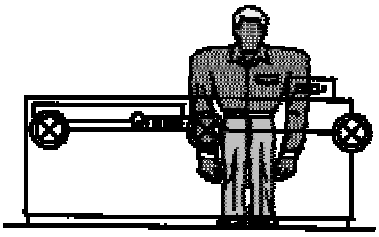


Some designers think that people look like this...

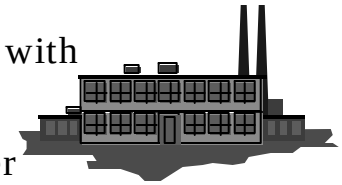


3

After all of the reach distances were determined and the forces measured a picture of the ideal employee for the job appears. If this machine was actually designed for an operator, that person was four feet tall, had an eight foot arm span, and had the strength of 3 average people.

This, and many other similar findings, led to the realization that throughout the industrial revolution little consideration was given to the actual operator when equipment or tasks were designed.

Formal Definitions



The study of man's relationship with his workplace.

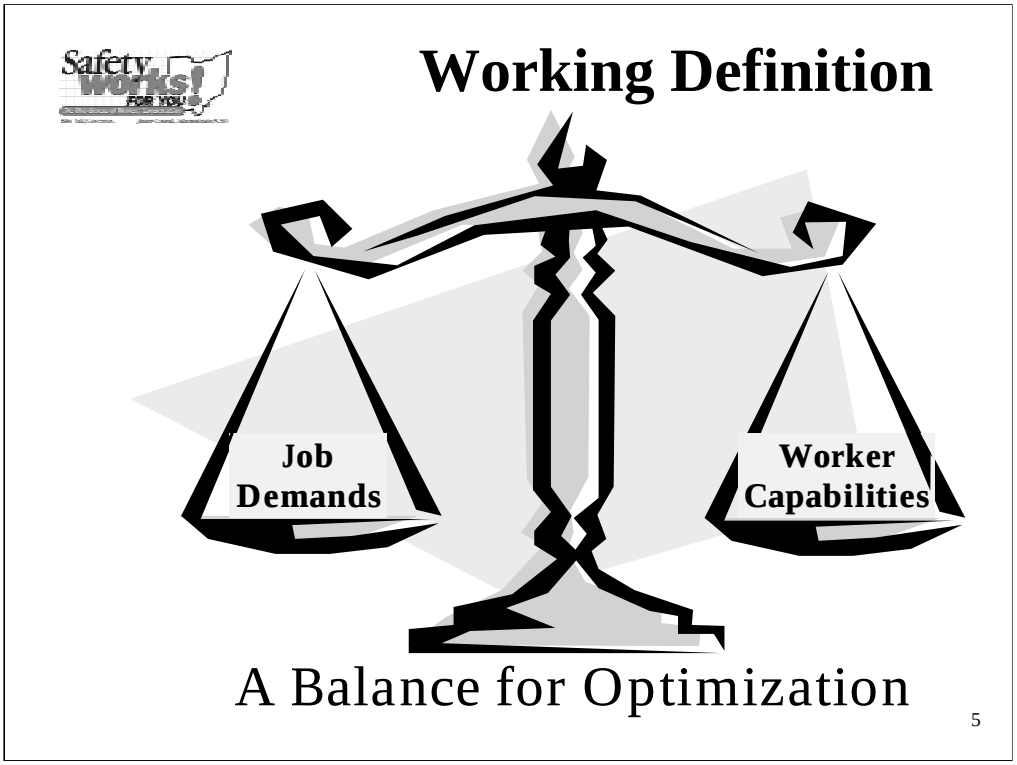
Fitting the task to the worker rather than forcing him / her to adapt to his working environment.

Designing the workplace to *prevent* occupational injury and illness.

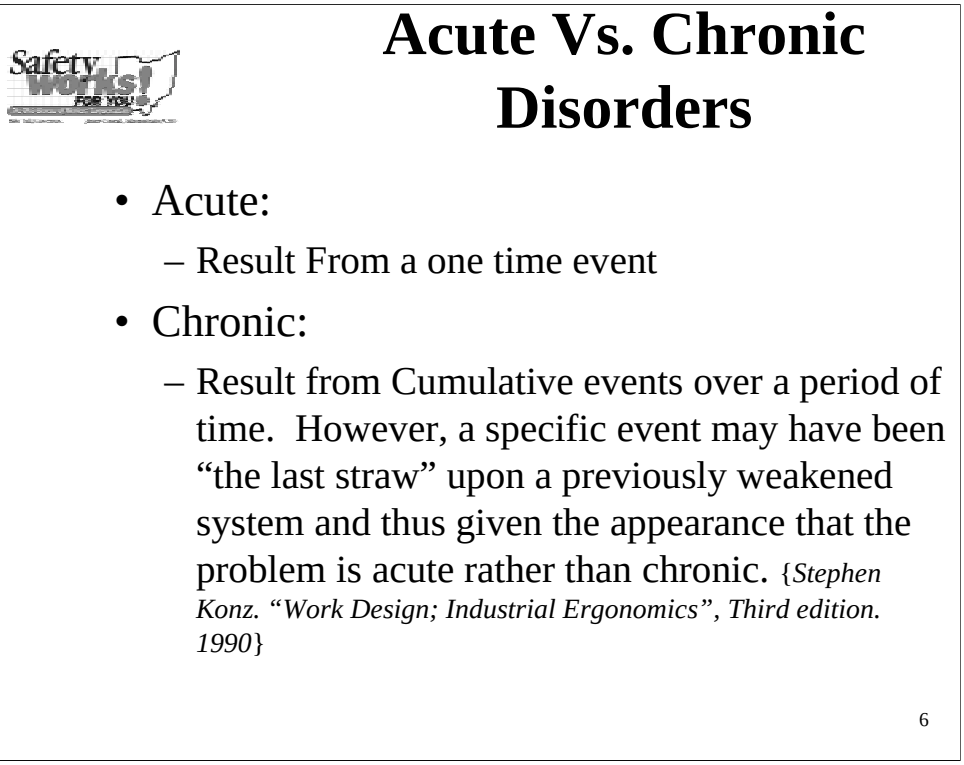
Discovering the capabilities and limitations of the human body.

4

There are many definitions of ergonomics.



A practical working definition is the process of balancing job demands with the limitations of the human body.



Acute Injuries are the type of injuries that traditional safety deals with preventing. These injuries result from a single event that has a clear cause-effect relationship.

Example: If a person cuts his/her finger, it is very simple to determine the cause. The individual usually knows the what, where, why, how, etc. of the injury.

Cumulative Injuries result from multiple events over a period of time. However, a specific event may have been "the last straw" for the previously weakened system, thus giving the appearance that the problem is acute rather than chronic. *{Stephen Konz. "working Design; Industrial Ergonomics", Third edition. 1990}*

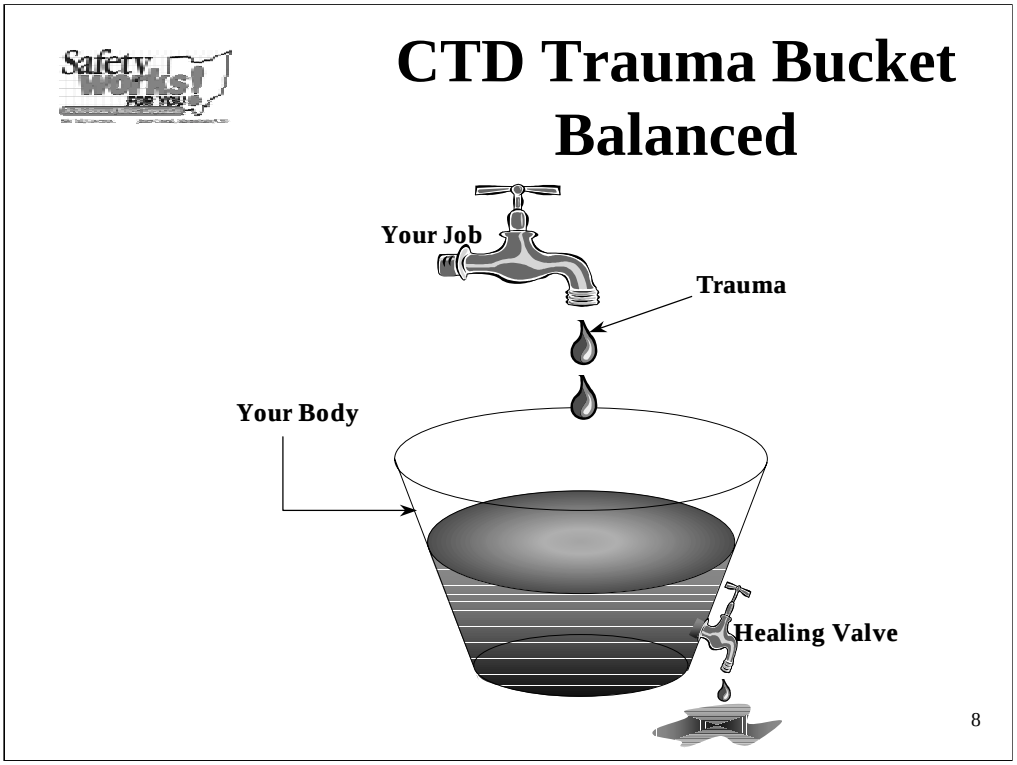
Example: Someone steps off of a curb, hops out of a truck, or picks up a small item from the floor and has a shooting, debilitating pain in their back. At first glance this may seem like an acute injury. However, the act of picking a small bolt up off of the floor is not a dangerous act that we should prohibit everyone from doing. And, it is obvious (since we all do similar activities daily) that it is not the sole cause of this injury. This action, that was associated with the pain, is simply that "last straw" that "broke their back". There were probably thousands of insults and injuries to this back before it reached the injury point.

CTDs

Term assigned to identify a group of injuries that classically result from long-term and repeated “wear and tear” on the musculoskeletal system.

- **CUMULATIVE** indicates injuries that develop gradually over time, and result from many repeated stresses on a particular body part.
- **TRAUMA** signifies bodily insult or injury from mechanical stresses.
- **DISORDERS** describes the adverse health effects that arise from chronic exposure to repeated trauma.

7



Cumulative Trauma Disorders(CTDs) are injuries and illnesses that develop over time. Most of the damage that causes them occurs before any symptoms become evident. Common CTDs are Carpal Tunnel Syndrome, tendentious, epicondalitis, and many back and neck injuries.

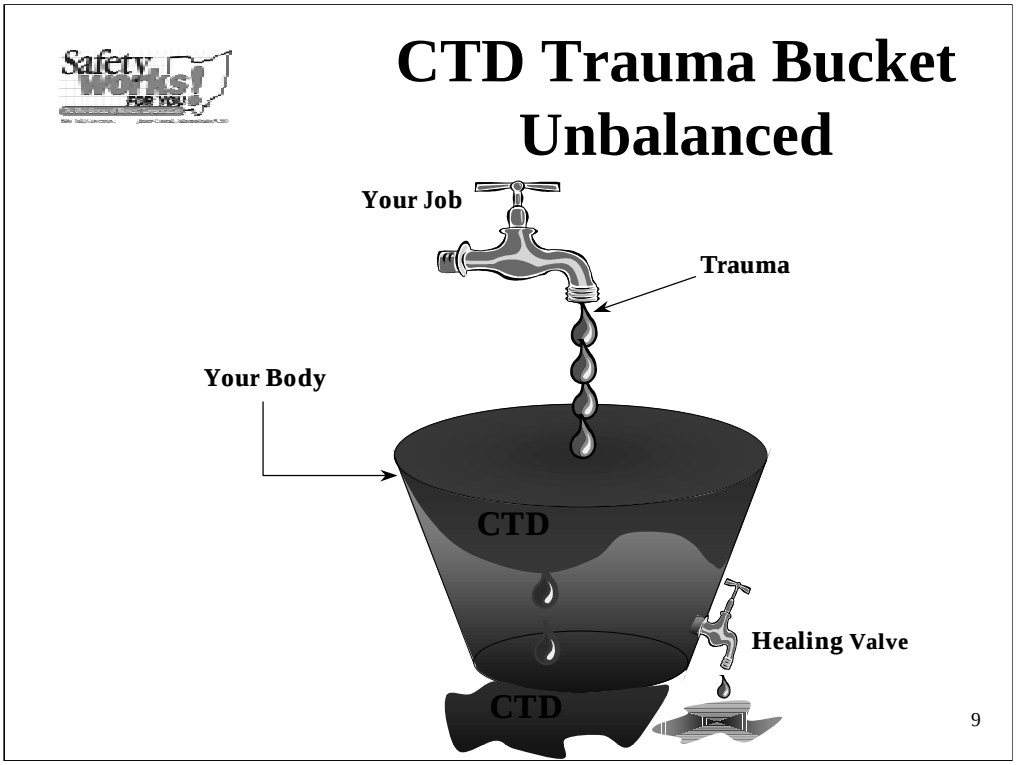
The Cumulative Trauma Bucket helps to demonstrate why it is so difficult sometimes to predict who will develop a CTD, when a person will develop a CTD, or what will cause a CTD.

The Bucket represents an individual's body and the amount of stress & strain, and wear & tear that it can handle without undue complications and illness. Everyone has a different size bucket. The size of the bucket can also change day to day, based on their overall stress level, how much sleep they got the night before, if they have recently been sick, etc.

The Healing Valve represents the body's ability to heal itself. The rate at which it heals can vary from day to day based on the person's overall health and stress levels.

The liquid in the bucket represents the Trauma (stress and damage) accumulated by the body which needs to be healed. This Trauma is the result of every day living, work, illness, etc.

The Job Valve represents the input of Trauma into this system from the job. Realistically we cannot eliminate this input completely. However, it can be controlled, to some degree, by properly adjusting the work environment.

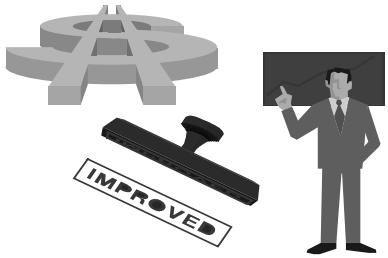


The reason for taking all practical steps possible to reduce the flow from the Job Valve is that if the Bucket overflows, the employee will develop a Cumulative Trauma Disorder.

The fact that the volume of the bucket, the healing rate, and other sources of trauma that take place off the job are uncontrollable by the company, increases the difficulty of prevention. That is why, in addition to the reduction of the Job Valve's flow rate, education is being provided to the employees to allow you the ability to participate in protecting yourselves.

Also, keep in mind that in many cases reduction in the stress and strain on the body from the Job Valve will not only prevent the condition from worsening but will allow the body to heal and eliminate the CTD.

Win/Win



Production

Quality

Compliance

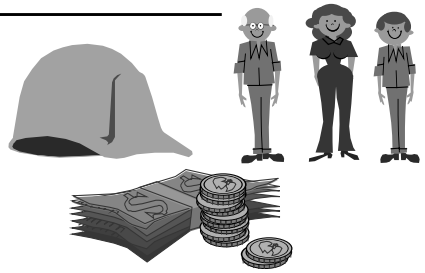
Compensation Costs

Careers/Employment Longevity

Safety Working Conditions

Quality of life

Morale



10

Employee Benefits

- Quality of Life
- Fewer Aches, Pains, & Injuries
- Career / Employment Protection & Longevity
- Jobs More Intuitive
- Less Fatigue

11

Production Benefits

- Less Fatigue
- Eliminates Unnecessary Handling
- Reduces Bottlenecks
- Increases Throughput
- Optimization Cycle Time
- Helps In Meeting Deadlines
- Well Designed Jobs
- Increase Profitability & Competitiveness

12

Quality Benefits

- Less Scrap & Re-Work
- Increased efficiency
- Reduction of rushing and shortcuts
- Less Fatigue
- Improves Customer Satisfaction
- Better accuracy

13

Compliance

- General Duty Clause
- Proposed Federal OSHA Standard
- Guidelines
  - NIOSH Elements of Ergonomics Process,1997
  - OSHA Meatpacking Guidelines, 1990
  - ANSI HFS-100/1988: VDT's
  - ANSI Z-365; Control of Work-Related CTDs, 1995

14

Compliance

"General Duty Clause" OSHA Act 1970

Section 5.(a)

(1) Each Employer shall furnish to each of his employees employment and place of employment which is free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employee.

15

OSHA Trade News Release

U.S. Department of Labor
Office of Public Affairs

TRADE NEWS RELEASE
Monday, June 10, 2002
Contact: Layne Lathram
Phone: (202) 693-1999

OSHA TO DEVELOP ERGONOMICS GUIDELINES FOR RETAIL GROCERY STORES, POULTRY PROCESSING

WASHINGTON – Grocery stores and poultry processing will be the focus of the next two sets of industry-specific guidelines to reduce ergonomic-related injuries, Assistant Secretary of Labor for Occupational Safety and Health John Henshaw announced today. Representatives from both industries will work with OSHA to develop the guidelines

16

News Release Continued:

"The number of ergonomic-related injuries suffered by workers in the retail grocery store industry continues to rank near the top of the list," Henshaw explained. "While the rates in poultry processing aren't as high, workers still suffer from too many upper extremity disorders, such as tendinitis and carpal tunnel syndrome.

"Several stakeholders within the retail grocery and poultry processing industries have committed to working with us in developing the guidelines," Henshaw said. "Furthermore, many employers in both industries have already begun identifying and addressing ergonomic hazards. We applaud them for stepping forward and taking a proactive stance for their workers."

Draft guidelines for each of these industries are expected to be ready for public comment later this year. The guidelines will be made available for review on OSHA's website; a ***Federal Register*** notice will announce when the guidelines will be posted.

U.S. Secretary of Labor Elaine L. Chao announced April 18 that OSHA would work with representatives of the nursing home profession on the first set of ergonomic guidelines. That announcement set into motion the agency's comprehensive plan to reduce ergonomic injuries in the workplace which focuses on a combination of industry-targeted guidelines, tough enforcement measures, workplace outreach, advanced research and dedicated efforts to protect Hispanic and other immigrant workers.

Henshaw announced OSHA's plans to develop the two new sets of industry-specific ergonomic guidelines during his keynote address to the American Society of Safety Engineers' 2002 Professional Development Conference and Exposition in Nashville.

Workers' Compensation / Loss Prevention

- Prevent Injuries/Illnesses from Occurring in the first place
- Reduction of the frequency of claims
- Reduction of Worker's Compensation Costs
- Reduction absenteeism
- Reduced turnover

CTD Costs

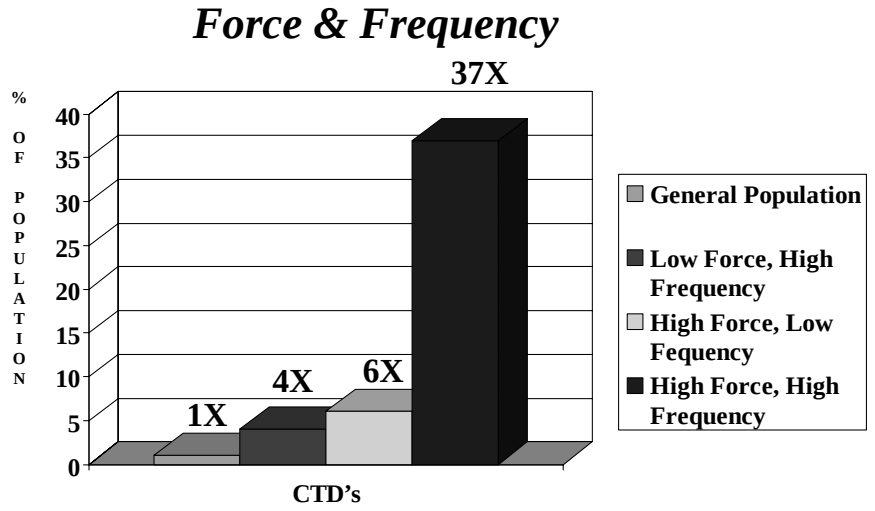
The average cost for Cumulative Trauma related Workers Compensation Claims filed in 2000 and 2001 equals $12,994

NSC Accident Facts 98

Risk Factors

- Repetition
- Forceful Exertion
- Direct Mechanical Pressure
- Static Posture
- Inadequate recovery
- Awkward Posture
- Environmental Stressors

Risk Factor Synergy



Source: Silverstein, et al., 1986

Risk factors have more than a cumulative effect. When two or more risk factors are present in a task, the risk is more than the sum of the two individual risks, increasing the potential for injury. The two have a multiplying or synergistic effect on each other.

In the study represented by the graph above, the repetitive risk factors increased the potential for injury four times greater than when there was only one risk factor. High force alone raised the potential for injury 6 times normal. When they were both present on a task the injury potential was not 10 times but 37 times normal.

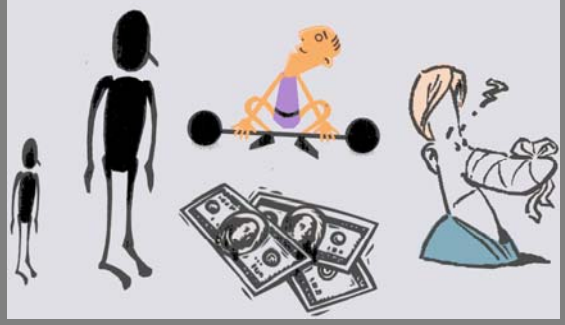
Welcome to Ergonomics

What Is ERGONOMICS ?

a. The study of soil.
b. Fitting the worker to the job.
c. A harsh laundry detergent.
d. Fitting the job to the worker.
e. An Australian rock group.

Thag not know !

Why is ergonomics important ?



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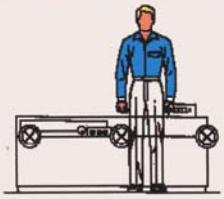

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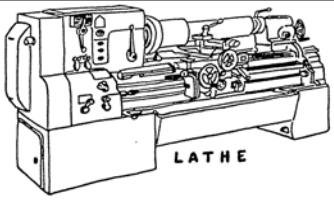
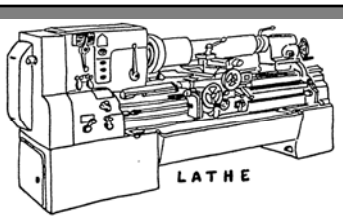
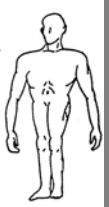


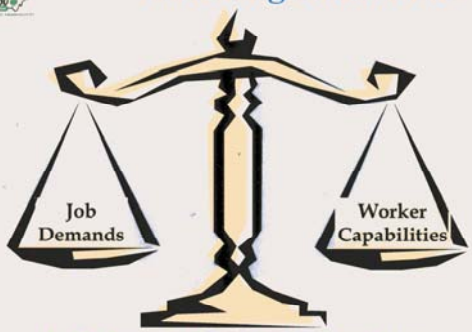
AVERAGE OPERATOR	
5' 9"	HEIGHT
19"	SHOULDER WIDTH
6' 0"	ARM SPAN
42"	ELBOW HEIGHT



AVERAGE OPERATOR		CRANFIELD MAN
5' 9"	HEIGHT	4' 5"
19"	SHOULDER WIDTH	24"
6' 0"	ARM SPAN	8' 0"
42"	ELBOW HEIGHT	30"



Working Definition



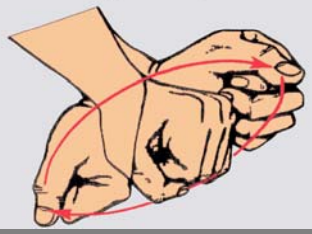
A Balance for Optimization

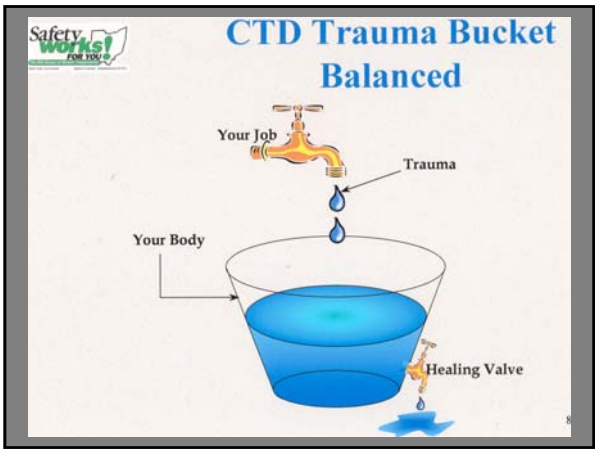
"Acute" versus "Chronic" disorders

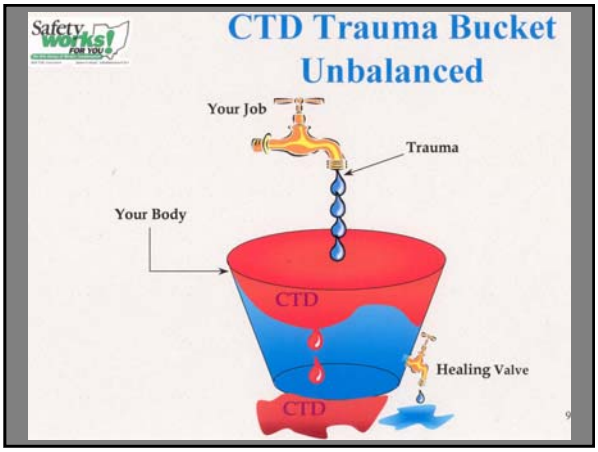
- Acute:
  - Result from a one time event
- Chronic:
  - Result from cumulative events over a period of time.

Cumulative Trauma Disorders (CTDs)

A group of injuries associated with long-term and repeated "wear and tear" on the musculoskeletal system.







Group Activity !

What are the benefits of good ergonomics for the employer ? For the employee ?

Consider the following:

- Production
- Quality
- Compliance
- Safety

Win/Win

- Production
- Quality
- Compliance
- Compensation Costs

- Careers/Employment Longevity
- Safety Working Conditions
- Quality of life
- Morale

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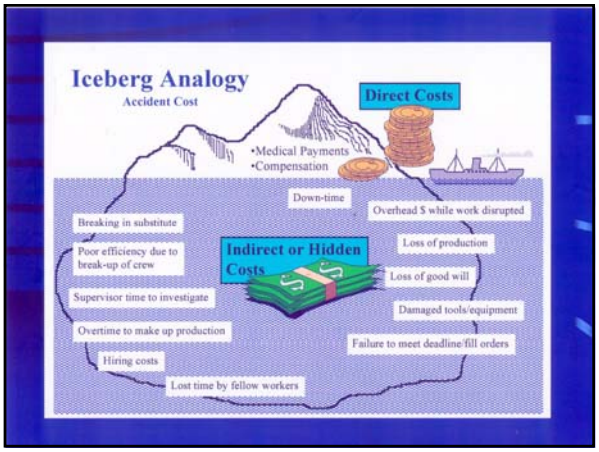
- Reduction of Worker's Compensation Costs
- Reduction absenteeism
- Reduced turnover

18



SOME CUMULATIVE TRAUMA DISORDERS

WRIST / HAND:
- Tendonitis
- Tenosynovitis
- DeQuervain's Disease
- Ganglion Cyst
- Trigger Finger
- Carpal Tunnel Syndrome
- Hand-Arm Vibration Syndrome (Vibration White Finger)

SHOULDER / ARM:
- Bursitis
- Tendonitis
- Epicondylitis
- Thoracic Outlet Syndrome

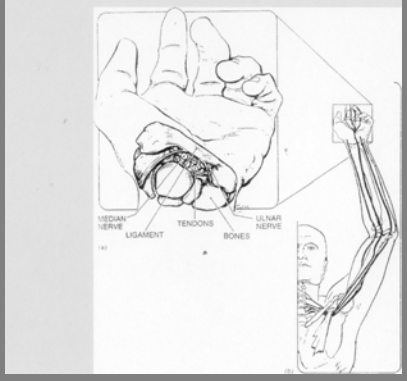
BACK / NECK:
- Muscle Spasm
- Back Strain
- Back Sprain
- Herniated Disc

Trivia Time!

Carpal Tunnel Syndrome (CTS) is defined as:

a. Mental illness.
b. A crack in the earth caused by a nuclear meltdown.
c. An injury to the median nerve in the wrist.
d. Too many cars attempting to pass through a tunnel at the same time.
e. An injury to the bones in the wrist.

The Carpal Tunnel



Group Activity !

What kinds of CTD injuries affect your industry ?

CTD Costs

The average cost for Cumulative Trauma related Workers Compensation Claims filed in 1995 and 1996 equals $11,434

NSC Accident Facts 98

Contributing Factors to CTDs

Occupational Risk Factors

Non-occupational Risk Factors

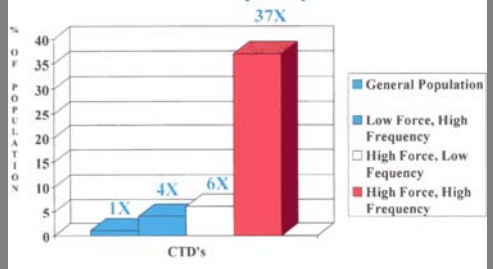
Personal Risk Factors

CTD Risk Factors

- Repetition
- Forceful Exertions
- Direct Mechanical Pressure
- Static Postures
- Awkward Postures
- Inadequate Recovery
- Environmental Stressors

Risk Factor Synergy

Force & Frequency



Source: Silverstein, et al., 1986

21

ACCIDENT INVESTIGATION

Introduction

Accident Prevention

Investigative Procedures

Fact-Finding

Interviews

Problem Solving Techniques

- **Change Analysis**
- **Job Safety Analysis**

Report of Investigation

Summary

Additional Source of Information:
Job Hazard Analysis - OSHA 3071 - 1.3 MB

Discussion/Overheads - 1 MB

Student Handouts - 119 KB

ACCIDENT INVESTIGATION

INTRODUCTION

Thousands of accidents occur throughout the United States every day. The failure of people, equipment, supplies, or surroundings to behave or react as expected causes most of the accidents. Accident investigations

determine how and why these failures occur. By using the information gained through an investigation, a similar or perhaps more disastrous accident may be prevented. Conduct accident investigations with accident prevention in mind. Investigations are NOT to place blame.

An accident is any unplanned event that results in personal injury or in property damage. When the personal injury requires little or no treatment, it is minor. If it results in a fatality or in a permanent total, permanent partial, or temporary total (lost-time) disability, it is serious. Similarly, property damage may be minor or serious. Investigate all accidents regardless of the extent of injury or damage.

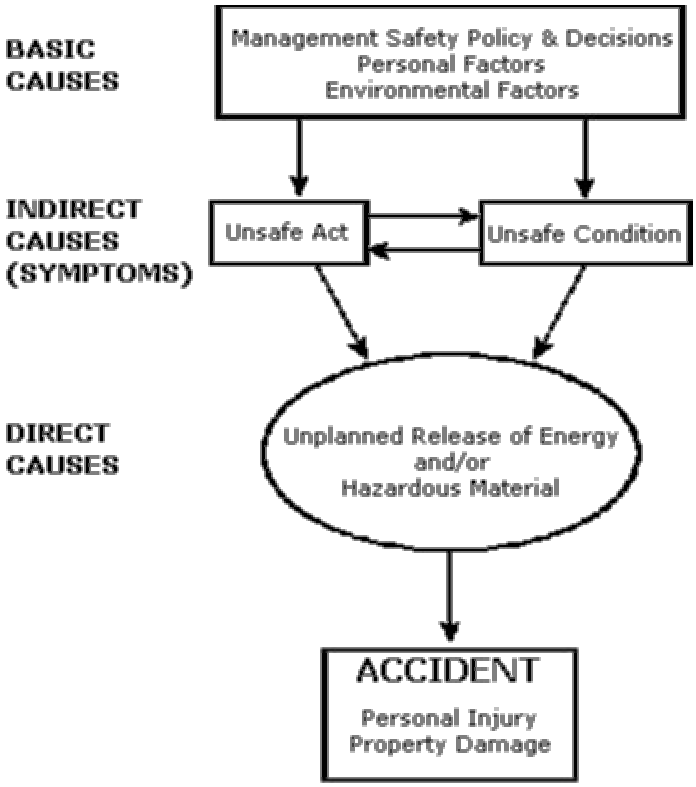
Accidents are part of a broad group of events that adversely affect the completion of a task. These events are incidents. For simplicity, the procedures discussed in later sections refer only to accidents. They are, however, also applicable to incidents.

This discussion introduces the reader to basic accident investigation procedures and describes accident analysis techniques.

ACCIDENT PREVENTION

Accidents are usually complex. An accident may have 10 or more events that can be causes. A detailed analysis of an accident will normally reveal three cause levels: basic, indirect, and direct. At the lowest level, an accident results only when a person or object receives an amount of energy or hazardous material that cannot be absorbed safely. This energy or hazardous material is the DIRECT CAUSE of the accident. The direct cause is usually the result of one or more unsafe acts or unsafe conditions, or both. Unsafe acts and conditions are the INDIRECT CAUSES or symptoms. In turn, indirect causes are usually traceable to poor management policies and decisions, or to personal or environmental factors. These are the BASIC CAUSES.

In spite of their complexity, most accidents are preventable by eliminating one or more causes. Accident investigations determine not only what happened, but also how and why. The information gained from these investigations can prevent recurrence of similar or perhaps more disastrous accidents. Accident investigators are interested in each event as well as in the sequence of events that led to an accident. The accident type is also important to the investigator. The recurrence of accidents of a particular type or those with common causes shows areas needing special accident prevention emphasis.



A detailed analysis of an accident will normally reveal three cause levels: basic, indirect, and direct.

INVESTIGATIVE PROCEDURES

The actual procedures used in a particular investigation depend on the nature and results of the accident. The agency having jurisdiction over the location determines the administrative procedures. In general, responsible officials will appoint an individual to be in charge of the investigation. The investigator uses most of the following steps:

1. Define the scope of the investigation.

2. Select the investigators. Assign specific tasks to each (preferably in writing).

3. Present a preliminary briefing to the investigating team, including:

    a. Description of the accident, with damage estimates.

    b. Normal operating procedures.

c. Maps (local and general).

d. Location of the accident site.

e. List of witnesses.

f. Events that preceded the accident.

4. Visit the accident site to get updated information.

5. Inspect the accident site.

a. Secure the area. Do not disturb the scene unless a hazard exists.

b. Prepare the necessary sketches and photographs. Label each carefully and keep accurate records.

6. Interview each victim and witness. Also interview those who were present before the accident and those who arrived at the site shortly after the accident. Keep accurate records of each interview. Use a tape recorder if desired and if approved.

7. Determine

a. What was not normal before the accident.

b. Where the abnormality occurred.

c. When it was first noted.

d. How it occurred.

8. Analyze the data obtained in step 7. Repeat any of the prior steps, if necessary.

9. Determine

a. Why the accident occurred.

b. A likely sequence of events and probable causes (direct, indirect, basic).

c. Alternative sequences.

10. Check each sequence against the data from step 7.

11. Determine the most likely sequence of events and the most probable causes.

12. Conduct a post-investigation briefing.

13. Prepare a summary report, including the recommended actions to prevent a recurrence. Distribute the report according to applicable instructions.

An investigation is not complete until all data are analyzed and a final report is completed. In practice, the investigative work, data analysis, and report preparation proceed simultaneously over much of the time spent on the investigation.

FACT-FINDING

Gather evidence from many sources during an investigation. Get information from witnesses and reports as well as by observation. Interview witnesses as soon as possible after an accident. Inspect the accident site before any changes occur. Take photographs and make sketches of the accident scene. Record all pertinent data on maps. Get copies of all reports. Documents containing normal operating procedures, flow diagrams, maintenance charts, or reports of difficulties or abnormalities are particularly useful. Keep complete and accurate notes in a bound notebook. Record pre-accident conditions, the accident sequence, and post-accident conditions. In addition, document the location of victims, witnesses, machinery, energy sources, and hazardous materials.

In some investigations, a particular physical or chemical law, principle, or property may explain a sequence of events. Include laws in the notes taken during the investigation or in the later analysis of data. In addition, gather data during the investigation that may lend itself to analysis by these laws, principles, or properties. An appendix in the final report can include an extended discussion.

INTERVIEWS

In general, experienced personnel should conduct interviews. If possible, the team assigned to this task should include an individual with a legal

background. In conducting interviews, the team should:

1. Appoint a speaker for the group.

2. Get preliminary statements as soon as possible from all witnesses.

3. Locate the position of each witness on a master chart (including the direction of view).

4. Arrange for a convenient time and place to talk to each witness.

5. Explain the purpose of the investigation (accident prevention) and put each witness at ease.

6. Listen, let each witness speak freely, and be courteous and considerate.

7. Take notes without distracting the witness. Use a tape recorder only with consent of the witness.

8. Use sketches and diagrams to help the witness.

9. Emphasize areas of direct observation. Label hearsay accordingly.

10. Be sincere and do not argue with the witness.

11. Record the exact words used by the witness to describe each observation. Do not "put words into a witness' mouth."

12. Word each question carefully and be sure the witness understands.

13. Identify the qualifications of each witness (name, address, occupation, years of experience, etc.).

14. Supply each witness with a copy of his or her statements. Signed statements are desirable.

After interviewing all witnesses, the team should analyze each witness' statement. They may wish to re-interview one or more witnesses to confirm or clarify key points. While there may be inconsistencies in witnesses' statements, investigators should assemble the available testimony into a logical order. Analyze this information along with data from the accident site.

Not all people react in the same manner to a particular stimulus. For example, a witness within close proximity to the accident may have an entirely different story from one who saw it at a distance. Some witnesses may also change their stories after they have discussed it with others. The reason for the change may be additional clues.

A witness who has had a traumatic experience may not be able to recall the details of the accident. A witness who has a vested interest in the results of the investigation may offer biased testimony. Finally, eyesight, hearing, reaction time, and the general condition of each witness may affect his or her powers of observation. A witness may omit entire sequences because of a failure to observe them or because their importance was not realized.

PROBLEM SOLVING TECHNIQUES

Accidents represent problems that must be solved through investigations. Several formal procedures solve problems of any degree of complexity. This section discusses two of the most common procedures: Change Analysis and Job Safety Ananlysis.

Change Analysis

As its name implies, this technique emphasizes change. To solve a problem, an investigator must look for deviations from the norm. Consider all problems to result from some unanticipated change. Make an analysis of the change to determine its causes. Use the following steps in this method:

1. Define the problem (What happened?).

2. Establish the norm (What should have happened?).

3. Identify, locate, and describe the change (What, where, when, to what extent).

4. Specify what was and what was not affected.

5. Identify the distinctive features of the change.

6. List the possible causes.

7. Select the most likely causes.

Job Safety Analysis

Job safety analysis (JSA) is part of many existing accident prevention programs. In general, JSA breaks a job into basic steps, and identifies the hazards associated with each step. The JSA also prescribes controls for each hazard. A JSA is a chart listing these steps, hazards, and controls. Review the JSA during the investigation if a JSA has been conducted for the job involved in an accident. Perform a JSA if one is not available. Perform a JSA as a part of the investigation to determine the events and conditions that led to the accident.

REPORT OF INVESTIGATION

As noted earlier, an accident investigation is not complete until a report is prepared and submitted to proper authorities. Special report forms are available in many cases. Other instances may require a more extended report. Such reports are often very elaborate and may include a cover page, a title page, an abstract, a table of contents, a commentary or narrative portion, a discussion of probable causes, and a section on conclusions and recommendations.

The following outline has been found especially useful in developing the information to be included in the formal report:

1. Background Information

    a. Where and when the accident occurred

    b. Who and what were involved

    c. Operating personnel and other witnesses

2. Account of the Accident (What happened?)

    a. Sequence of events

    b. Extent of damage

    c. Accident type

    d. Agency or source (of energy or hazardous material)

3. Discussion (Analysis of the Accident - **HOW; WHY**)

a. Direct causes (energy sources; hazardous materials)

b. Indirect causes (unsafe acts and conditions)

c. Basic causes (management policies; personal or environmental factors)

4. Recommendations (to prevent a recurrence) for immediate and long-range action to remedy:

a. Basic causes

b. Indirect causes

c. Direct causes (such as reduced quantities or protective equipment or structures)

SUMMARY

Thousands of accidents occur daily throughout the United States. These result from a failure of people, equipment, supplies, or surroundings to behave as expected. A successful accident investigation determines not only what happened, but also finds how and why the accident occurred. Investigations are an effort to prevent a similar or perhaps more disastrous sequence of events.

Most accident investigations follow formal procedures. This discussion covered two of the most common procedures: Change Analysis and Job Safety Analysis. An investigation is not complete however, until completion of a final report. Responsible officials can then use the resulting information and recommendations to prevent future accidents.

Discussion / Overheads - 1 MB

Student Handouts - 119 KB

ACCIDENT ANALYSIS

Written Program

Purpose

The purpose of this program is to define and document the accident analysis process at (*name of company*).

This program defines the responsibilities of all company management and supervisors in analyzing the causes of accidents and implementing appropriate corrective actions to prevent similar situations from recurring.

Definitions

Accident: Any unwanted happening, movement, or release of energy.

Accident Analysis: The process of determining the causes of accidents and implementing corrective actions to prevent recurrence.

Hazard: Anything that presents a danger to employees or property.

Hazard Control: Any method used to reduce or eliminate a hazard, such as:

- Engineering controls
- Administrative controls
- Personal Protective Equipment
- Housekeeping
- Safe work practices
- Training

Incident: Any accident that caused or could have caused an injury, illness, or damage to equipment.

OSHA No. 300: Log and Summary of Occupational Injuries and Illnesses, on which fatalities, regardless of the time between the injury and death, or the length of the illness; or lost workday cases; nonfatal cases without lost workdays which result in transfer to another job or termination of employment, or require medical treatment; or involve loss of consciousness, restriction of work or motion. Also used to summarize the log at the end of the year to satisfy employer posting requirements.

Responsibilities

The Program Administrator is (*person's name/title*).

This person is responsible for:

- Administering the program and issuing written material that support it;
- Coordinating all activities related to hazard control, insurance companies (e.g. workers' compensation), and OSHA, state and local regulatory compliance;
- Maintaining OSHA recordkeeping on the OSHA 300 Log and Summary of Occupational Injuries and Illnesses;
- Reporting all serious accidents that result in fatalities or hospitalization of three (3) or more employees to the local OSHA area office within eight (8) hours of occurrence;
- Analyzing accident records to identify program deficiencies;
- Scheduling managers, supervisors and, as appropriate, safety committee members for training;
- Maintaining training recordkeeping; and
- Posting the Summary of the OSHA 300 during the month of February.

Supervisors and Managers:

These people are responsible for:

- Conducting accident analyses within their departments and providing appropriate corrective actions; and
- Initiating accident analyses immediately upon notification and completing them within twenty-four (24) hours after learning of its occurrence.

Program Activities

General

- All employees will report all incidents immediately to their respective supervisor and/or manager.
- All accidents that result in employee injuries, property damage or the probability thereof will be analyzed.
- A company analysis report will be completed within twenty-four (24) hours of an accident.
- The accident analysis will be completed according to the accident analysis procedure included.

- Department management will initiate corrective action according to the corrective action plan on the company accident report. Corrective actions that cannot be initiated immediately will be documented in a written report that indicates what will be done, when, and by whom. A copy of the corrective action report will be forwarded to the Safety Program Administrator within five (5) days of the incident.
- Any accident that results in sending employees to outside medical treatment will be reported to company management and the Safety Program Administrator immediately.

Safety Committee

- Will review accident analyses and make recommendations for corrections.
- Will review incident and near-miss analyses and, when necessary, submit suggestions to prevent future accidents.

Training

- All supervisors and managers will be trained and knowledgeable in accident analyses and the safety and health hazards to which employees under their immediate direction and control may be exposed.

Recordkeeping

- All accident reports generated shall be kept a minimum of six (6) years.
- All OSHA 300 Logs shall be retained a minimum of six (6) years.
- It's recommended that records be kept indefinitely to maintain the information necessary to provide an adequate history of conditions that have been responsible for accidents and what corrective actions have been taken.
- The Summary of the company OSHA 300 will be posted on the employee bulletin board for the month of February.
- All records shall be kept documenting training for each employee, including employee name or other identifier, training date(s), type(s) of training and training providers.

Recordkeeping

Accident Recordkeeping

Keep accurate records of all accident analysis activities, including:

- OSHA Form No. 300, Log and Summary of Occupational Injuries and Illnesses;
- First reports of injuries and illnesses;
- Workers' compensation forms; and
- Accident Investigation report forms.

Training Recordkeeping

A written certification record of all accident analysis training activities must be maintained. It should include:

- The name (or other identity) of the person trained.
- The Social Security Number of the person trained.
- The date(s) of training.
- The signature of the person conducting the training or of the employer.

BWC *Ohio Bureau of Workers' Compensation*
Division of Safety & Hygiene

Workers' Compensation claim # _____
OSHA 300 case/file # _____

ACCIDENT ANALYSIS REPORT

PART 1 IDENTIFICATION INFORMATION

Employee Name _____

Date of Accident _____ Time _____ AM PM

Occupation _____ Shift _____

Department _____ ID _____

PART 2 SUPPLEMENTARY INFORMATION

Company _____

Mailing Address _____

_____
City State Zip Code

Telephone ( )

Establishment Location (if different from above) _____

_____

Accident Location ☐ Same as establishment? ☐ On premises? (Check if applies)

_____

_____

Employee Address _____

_____
City State Zip Code

Telephone ( ) Social Security Number _____

Sex _____ Age _____ Date of Birth _____

Was injured person performing regular job at time of accident? ☐ Yes ☐ No

Length of service: With employer _____ On this job _____

Time shift started _____ ☐ AM ☐ PM Overtime? ☐ Yes ☐ No

Name and address of Physician _____

_____
City State Zip Code

If hospitalized, name and address of hospital _____

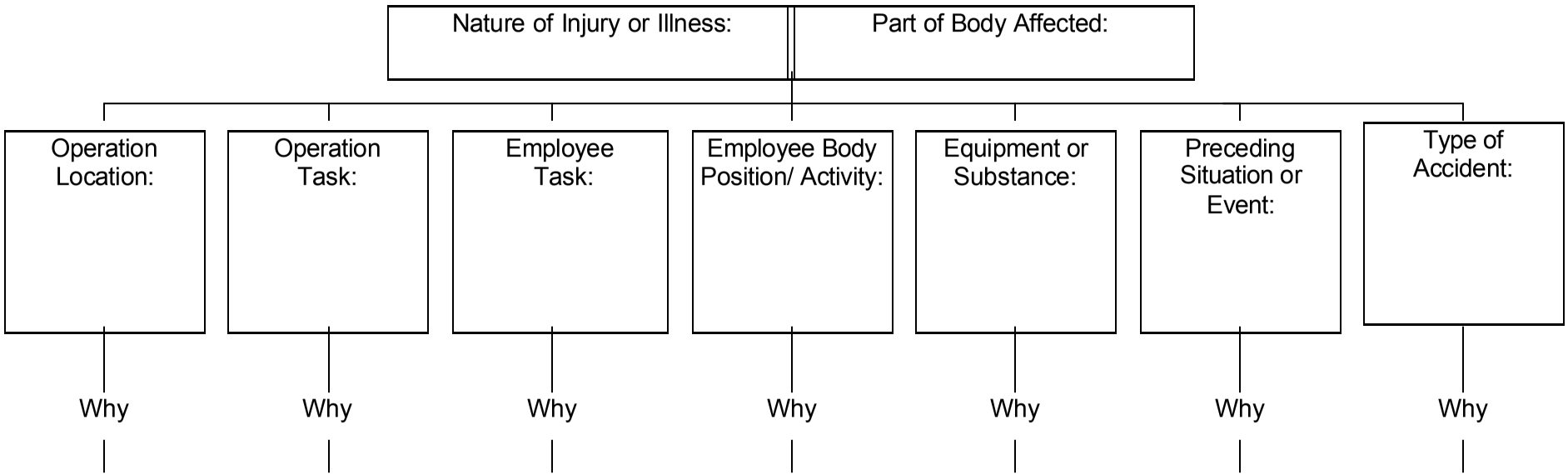
_____
City State Zip Code

Fatality? ☐ Yes ☐ No If Yes, date of death _____

If death, attach Coroner's Report.

Revised March 1998

PART 3	ACCIDENT TREE	(Refer to Instructions)



PART 4 DESCRIPTION AND ANALYSIS

Fully describe accident: _____

Attach photographs of accident scene and machinery/equipment.

What factors led to the accident (from Accident Tree in Part 3)? _____

MACHINERY/EQUIPMENT INVOLVED

Manufacturer _____ Equipment Age _____

Serial No. _____ Model _____

Function _____

Location _____

1. Has machine/equipment been modified?
2. Was it guarded properly?
3. Was there any mechanical failure?

To answer these questions, research and attach equipment history, maintenance history, relevant photographs and other reports and comments.

CONSTRUCTION

If construction-related, date of contract _____

Is firm ☐ General Contractor or ☐ Subcontractor

Names of other contractors _____

WEATHER/ENVIRONMENTAL CONDITIONS (temperature, housekeeping, lighting, work surfaces, etc.)

TRAINING

Did employee receive specific training or instructions relating to safety and health on the job being performed?

☐ Yes ☐ No

If Yes: Type: _____

Instructed by: _____

When instructed: _____ Length of training _____

Attach appropriate training documentation.

PART 5 SPECIFIC ACTION THAT WILL BE TAKEN

ITEM #	DESCRIPTION	ROUTE TO	TARGET DATE

WHAT ADDITIONAL ACTIONS SHOULD BE CONSIDERED?

_____

_____

_____

_____

_____

Completed by: _____ Date of Investigation _____

Title: _____

Reviewed by: _____ Date _____

Reviewed by: _____ Date _____

Attach individual statements from :

(a) the injured worker
(b) any witness(es) or others with contributing information
(c) the employer.

For each statement, include name, job title, home address, home telephone number, and the date the statement was given.

INSTRUCTIONS

OSHA 101 FORM COMPATIBILITY–When fully completed, this report is believed to satisfy the requirements of the OSHA 101 form.

COMPLETION OF THIS REPORT--Parts 1 and 2 may be filled out by office personnel or other staff assigned this function. Parts 3, 4 and 5 **must** be completely filled out by the first line supervisor, in coordination with plant manager and safety director.

PROCEDURE FOR COMPLETING PART 3--ACCIDENT TREE

A. Fill in the top blocks of the tree.

Describe the NATURE of the injury or illness.

This could be a strain, sprain, laceration, contusion, abrasion, carpal tunnel syndrome, and so forth. Write in the space provided at the top of the tree.

Determine the PART OF THE BODY AFFECTED (such as right index finger, shoulder, lower back, and so forth.) and place this information in the adjacent space provided at the top of the tree.

If these specific details are not fully known at this time, do not wait to perform the investigation! Fill out as much as possible and continue.

If investigating accident or near miss, write *none* in "Nature of Injury or Illness" and "Part of Body Affected" blocks, and continue to next row of tree.

B. Fill in the next row of the tree.

1. Operation--Location

Where is the work being performed? Example: Working in assembly area.

2. Operation Task

On a larger scale, what specific operation is being performed? Examples: Milling keyway in shaft; Stocking shelves.

3. Employee Task

What specific task was the employee performing? Examples: Employee lifting box; Employee was fastening bolt.

4. Employee Body Position/Activity

Briefly describe the position required by the activity that relates to the accident, injury or illness. Examples: Wrist flexed forward; Hands grasping box.

5. Equipment or Substance

What is the equipment or substance which was directly involved in the accident, injury or illness? Examples: The machine or object struck against; The vapor or contaminant inhaled or swallowed; The object lifted, pulled.

6. Preceding Situation or Event

Determine important event(s) that led to the accident, injury, or illness. These may be considered as "triggering events", situations, or circumstances necessary for the accident to occur.

7. Type of Accident

What general type of accident occurred? Examples: Fall off a platform; Slipped on oil; Struck by machine tool; Contact with electricity; Exposure to hazardous substances.

C. Trace each factor in more detail.

Work from each of the factors identified above. Ask why each of the factors is necessary, or why they occurred. Under each factor, write the key words describing "why", and draw a line to connect the two. It is possible for there to be more than one reason "why" under each factor, so be sure to include all that you discover.

D. Repeat the process--build the tree.

The process in step three can be repeated until all questions are answered for each path of the tree. Dead ends are either unanswered questions that require additional investigation or pathways that have been resolved as far as practical.

INCIDENT SCENE PRIORITIES

First Priorities at the Scene of the Incident	• Arrive safely and take charge. • Observe the overall scene upon arrival and evaluate the situation. • Care of the injured. • Protect others from injury. • Remove onlookers from the immediate area.
Secondary Priorities at the Scene of the Incident	• Preserve the evidence. • Protect the incident scene. • Secure the evidence. • Keep the boss informed.
Preserving Evidence	• Control crowds and traffic. • Take charge. • Take photographs or make sketches. • Hold witnesses. • Erect barriers.
Gathering Evidence	• Gather samples. • Label samples. • Take measurements. • Identify photos or sketches. • Identify witnesses by name, address, etc.
Interviewing Witnesses	• Interview in a quiet, neutral, non-threatening location. • Tell witnesses the purpose of the interview. • Record essential information. • Let witness tell the story in their own terms; do not interrupt. • Use a recorder (with approval) and take notes. • Avoid leading questions, be neutral, and use tact and diplomacy.

ACCIDENT CAUSATION

Task -- Explore the actual work procedure being used.
Was a safe work procedure used?
Had conditions changed to make the normal procedure unsafe?
Were the appropriate tools and materials available?
Were they used?
Were the safety devices working properly?

Material -- Seek out possible causes brought about by the equipment and materials.
Was there an equipment failure?
Was the machinery poorly designed?
Were hazardous substances involved?
Was the raw material substandard in some way?
Should personal protective equipment have been used?

Environment -- Have there been any sudden changes to the physical environment?
What were the weather conditions?
Was poor housekeeping a problem?
Was it too hot or too cold?
Was noise or air contaminants a problem?
Was there adequate light?

Personal -- Consider the physical and mental condition of the individuals involved.
Were the workers experienced in the work being done?
Had they been adequately trained?
Were they physically capable of doing the work?
What was the status of their health?
Were they under stress (work or personal)?

Management -- Consider the role of supervisors and upper management.
Were safety rules in effect?
Was adequate supervision and training given?
Had hazards been previously identified?
Were unsafe conditions corrected?
Were regular safety inspections carried out?

Supervisors Accident Investigation Report

(ALL INJURIES MUST BE REPORTED TO FIRST AID)

COMPANY OR ORIGIN	DEPARTMENT NAME AND NUMBER		
XYZ COMPANY	**MAINTENANCE**		
EXACT LOCATION AND GENERAL AREA	DATE OF OCCURRENCE.	TIME ☐ A.M.	DATE REPORTED
SHOP FLOOR	**6/1/00**	**3: 00** ☐ P.M.	**SAME**

PERSONAL INJURY	**PROPERTY DAMAGE**
INJURED'S NAME AND SOCIAL SECURITY NUMBER	PROPERTY DAMAGED
JIM SMITH	**NONE**
OCCUPATION / INJURED BODY PART	NATURE OF DAMAGE
MAINTENANCE LEG & HEAD	
NATURE OF INJURY	OBJECT/EQUIPMENT/SUBSTANCE CAUSING INJURY
HURT LEG & HEAD	
OBJECT/EQUIPMENT/SUBSTANCE CAUSING INJURY	PERSON(S) WITH MOST CONTROL OF OBJECT/EQUIPMENT/SUBSTANCE
FORKLIFT	
PERSON(S) WITH MOST CONTROL OF OBJECT/EQUIPMENT/SUBSTANCE	ESTIMATED COSTS / FOR INTERNAL USE – DO NOT COMPLETE
TOM BROWN	

DESCRIBE CLEARLY HOW THE ACCIDENT OCCURRED:

TOM RAN INTO JIM'S LADDER WITH HIS FORKLIFT

WITNESS: **NONE**

LEAD ON DUTY:

DESCRIBE CLEARLY HOW THE ACCIDENT OCCURRED:

TOM'S FORKLIFT COULDN'T STOP.

WHAT ACTION(S) HAS OR WILL BE TAKEN TO PREVENT RECURRENCE? PLACE X AND DATE BY ITEM(S) COMPLETED

TELL TOM TO BE MORE CAREFUL NEXT TIME.

WHO GAVE FIRST AID, IF ANY _____	REPORT COMPLETED BY / DATE / EXTENSION
DID INJURED LEAVE WORK? _____ TIME _____A.M. / P.M.	**STEVE MILLER** **6/2/00**
DID INJURED RETURN TO WORK? _____ TIME _____A.M. / P.M.	REPORT COMPLETED BY / DATE / EXTENSION

BWC *Ohio Bureau of Workers' Compensation*
Division of Safety & Hygiene

Workers' Compensation claim # _____
OSHA 300 case/file # _____

ACCIDENT ANALYSIS REPORT

PART 1 IDENTIFICATION INFORMATION

Employee Name: **JIM SMITH**

Date of Accident: **6/1/00** Time: **3:00** AM (PM)

Occupation: **MAINTENANCE** Shift: **1st**

Department: **MAINTENANCE** ID: **000**

PART 2 SUPPLEMENTARY INFORMATION

Company: **XYZ COMPANY**

Mailing Address: **0000 ANY STREET**

DAYTON (City) **OHIO** (State) **45401** (Zip Code)

Telephone: **(000) 000-0000**

Establishment Location (if different from above): **(SAME AS ABOVE)**

Accident Location ☐ Same as establishment? ☒ On premises? (Check if applies)
WAREHOUSE AISLE #3

Employee Address: **000 SOME STREET**

DAYTON (City) **OHIO** (State) **45401** (Zip Code)

Telephone: **(000) 000-0000** Social Security Number: **000-00-000**

Sex: **MALE** Age: **32** Date of Birth: **03/31/68**

Was injured person performing regular job at time of accident? ☒ Yes ☐ No

Length of service: With employer **6 YRS** On this job **5 YRS**

Time shift started **7:00** ☒ AM ☐ PM Overtime? ☐ Yes ☒ No

Name and address of Physician: **DR. DOCKTOR**

DAYTON (City) **OHIO** (State) **45401** (Zip Code)

If hospitalized, name and address of hospital: **DSH HOSPITAL**

DAYTON (City) **OHIO** (State) **45401** (Zip Code)

Fatality? ☐ Yes ☒ No If Yes, date of death _____

If death, attach Coroner's Report.

Revised March 1998

PART 3	ACCIDENT TREE	(Refer to Instructions)

Nature of Injury or Illness:	Part of Body Affected:
FRACTURE	**LEFT LEG**

Operation Location:	Operation Task:	Employee Task:	Employee Body Position/ Activity:	Agency:	Preceding Situation or Event:	Type of Accident:
WAREHOUSE - AISLE #3	**MAINTENANCE**	**REPAIRING OVERHEAD DOOR**	**STANDING ON STEP LADDER**	**FORKLIFT**	**FORKLIFT COULD NOT STOP**	**FALL TO DIFFERENT LEVEL**
Designated by company	**Regular job**	**Directed to do by supervisor**	**To reach work area**	**Moving material from warehouse to production**		**Forklift hits ladder**
Access between warehouse and production areas		**Malfunctioning door**	**No other means available**	**Directed to do by supervisor**		**Ladder in doorway**
				Shortage of space		**No barrier signs**
						No policy

Defective brakes	Cooking oil on floor	Going too fast
Delayed brake maintenance	**Inadequate housekeeping**	**No speed limits**
Lack of personnel	**Program not enforced**	**Rules not enforced**

PART 4 DESCRIPTION AND ANALYSIS

Fully describe accident: **(SEE ATTACHMENT #1)**

Attach photographs of accident scene and machinery/equipment.

What factors led to the accident (from Accident Tree in Part 3)? **(SEE ATTACHMENT #2)**

MACHINERY/EQUIPMENT INVOLVED

Manufacturer **MULE, INC.** Equipment Age **10 YEARS**

Serial No. **A123456** Model **RAH SERIES**

Function **MECHANICAL MATERIAL HANDLER**

Location **PRODUCTION AND WAREHOUSE**

4. Has machine/equipment been modified? **NO**
5. Was it guarded properly? **YES**
6. Was there any mechanical failure? **NO**

To answer these questions, research and attach equipment history, maintenance history, relevant photographs and other reports and comments.

CONSTRUCTION N/A

If construction-related, date of contract

Is firm ☐ General Contractor or ☐ Subcontractor

Names of other contractors

WEATHER/ENVIRONMENTAL CONDITIONS (temperature, housekeeping, lighting, work surfaces, etc.)
COOKING OIL ON FLOOR; BLIND CORNERS

TRAINING

Did employee receive specific training or instructions relating to safety and health on the job being performed?

☐ Yes ☒ No

If Yes: Type: _____

Instructed by: _____

When instructed: _____ Length of training _____

Attach appropriate training documentation.

PART 5 SPECIFIC ACTION THAT WILL BE TAKEN

ITEM #	DESCRIPTION	ROUTE TO	TARGET DATE
	SEE ATTACHMENT "PREVENTIVE MEASURES FOR JIM'S ACCIDENT"		

WHAT ADDITIONAL ACTIONS SHOULD BE CONSIDERED?

Completed by: **STEVE MILLER** Date of Investigation **6/1/00**

Title: **SAFETY COORDINATOR**

Reviewed by: _____ Date _____

Reviewed by: _____ Date _____

Attach individual statements from :

(d) the injured worker
(e) any witness(es) or others with contributing information
(f) the employer.

For each statement, include name, job title, home address, home telephone number, and the date the statement was given.

INSTRUCTIONS

OSHA 101 FORM COMPATIBILITY--When fully completed, this report is believed to satisfy the requirements of the OSHA 101 form.

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If investigating accident or near miss, write *none* in "Nature of Injury or Illness" and "Part of Body Affected" blocks, and continue to next row of tree.

B. Fill in the next row of the tree.

1. Operation--Location
Where is the work being performed? Example: Working in assembly area.

2. Operation Task
On a larger scale, what specific operation is being performed? Examples: Milling keyway in shaft; Stocking shelves.

3. Employee Task
What specific task was the employee performing? Examples: Employee lifting box; Employee was fastening bolt.

4. Employee Body Position/Activity
Briefly describe the position required by the activity that relates to the accident, injury or illness. Examples: Wrist flexed forward; Hands grasping box.

5. Equipment or Substance
What is the equipment or substance which was directly involved in the accident, injury or illness? Examples: The machine or object struck against; The vapor or contaminant inhaled or swallowed; The object lifted, pulled.

6. Preceding Situation or Event
Determine important event(s) that led to the accident, injury, or illness. These may be considered as "triggering events", situations, or circumstances necessary for the accident to occur.

7. Type of Accident
What general type of accident occurred? Examples: Fall off a platform; Slipped on oil; Struck by machine tool; Contact with electricity; Exposure to hazardous substances.

C. Trace each factor in more detail.

Work from each of the factors identified above. Ask why each of the factors is necessary, or why they occurred. Under each factor, write the key words describing "why", and draw a line to connect the two. It is possible for there to be more than one reason "why" under each factor, so be sure to include all that you discover.

D. Repeat the process--build the tree.

The process in step three can be repeated until all questions are answered for each path of the tree. Dead ends are either unanswered questions that require additional investigation or pathways that have been resolved as far as practical.

Example of better report

Attachment # 1

Fully describe accident:

Frank instructed Jim to repair the overhead door in aisle #3.

At about the same time, Alice directed Tom to remove some boxes of packaged product from her area and to bring more boxing material to the department.

When Tom was traveling from the warehouse to the production department, he encountered Jim on a stepladder in the middle to the doorway. Unable to stop or avoid the ladder, Tom struck the ladder with Jim on it. The ladder was knocked out from under Jim. Jim first fell onto the top of the load Tom was moving from the warehouse, then onto the floor. Jim's left leg broke when it finally struck against the overturned ladder.

Attachment # 2

What factors led to the accident?

Frank supervises Jim in the maintenance department. Frank instructed Jim to repair the fire door located between the warehouse and production area because it had been reported as not working properly. Although Jim wanted to leave work early for a trout-fishing tournament, he agreed to repair the door. There is no company policy to protect workers when work is being performed in an aisle or doorway. Jim selected the tallest stepladder and set it up so he could inspect the door's mechanical linkage. Jim was on the next to the top step of the ladder when Tom struck the ladder.

Frank is also responsible for the maintenance of the company's forklifts. He admits, that due to lack of personnel, the brakes on Tom's forklift had not received proper maintenance. Frank has not taken forklifts, needing maintenance, out of service.

As a forklift operator, Tom receives directions to move material from all supervisors. Alice supervises the production department. Since there is a shortage of storage space in her department, she instructed Tom to remove some packaged material from the department and to bring more boxing material to the area. Tom acknowledged to Alice that the forklift's brakes were not working properly after narrowly missing Alice with the forklift. Tom had previously reported the bad brakes to maintenance but continued to operate it since repairs were not being done. Alice and at least one other witness reported that Tom operated the forklift too fast in the vicinity of the doorway.

Earlier on the day of the incident, Kathy told Alice there was some cooking oil on the floor of the doorway from production to the warehouse. Alice did not inform anyone of the spill nor direct it to be cleaned up.

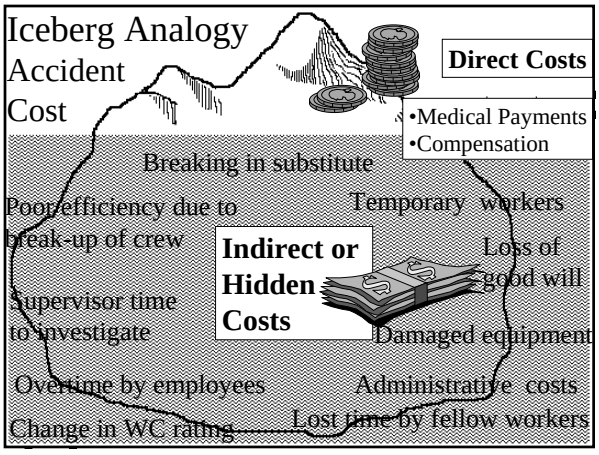
Preventive Measures for Jim's Accident

- Repair fire-door (and investigate why it was not working properly)
- Develop and implement LOTO procedure for all fire-doors
- Purchase scissors-lift
- Conduct scissors-lift training
- Hold maintenance man accountable for standing on step-ladder unsafely
- Conduct ladder safety training
- Develop and implement a fall protection program
- Analyze the need for additional production storage space
- Develop and implement a forklift inspection program
- Develop and implement a planned maintenance program for forklifts
- Develop and implement a "deadline" policy for all powered equipment
- Hold supervisor accountable for allowing the forklift with brakes needing repair to be operated
- Clean-up spills immediately (and investigate how the oil was spilled)
- Encourage all employees to practice good housekeeping
- Hold supervisor accountable for not responding to report of spilled oil
- Purchase and install convex mirrors at all blind-corners
- Hold forklift operator accountable for operating the forklift unsafely
- Conduct forklift refresher training
- Hold supervisor accountable for not enforcing safe operation of forklift rules
- Develop and implement a worksite barricade policy
- Purchase worksite barricades


Example of
better report

What is an Accident?

Why Investigate?



Causal Factors

(1) Task
(2) Material
(3) Environment
(4) Human Factor (Personal)
(5) Management/Process Failure

Accident Investigation Page # 42

(1) Task

- Ergonomics
- Safety work procedures
- Condition changes
- Process
- Materials
- Workers
- Appropriate tools/materials
- Safety devices (including lockout)

(2) Material

- Equipment failure
- Machinery design/guarding
- Hazardous substances
- Substandard material

(3) Environment

- Weather conditions
- Housekeeping
- Temperature
- Lighting
- Air contaminants
- Personal Protective Equipment

(4) Human Factor (Personal)

- Level of experience
- Level of Training
- Physical capability
- Health
- Fatigue
- Stress

(5) Management/Process Failure

- Visible Active senior management support for safety
- Safety policies
- Enforcement of safety policies
- Adequate supervision
- Knowledge of hazards
- Hazard corrective action
- Preventive maintenance
- Regular audits

Investigation Priorities

- 1st - Medical attention
- 2nd – Investigation
- 3rd – Analyze & Conclude

Accident Investigation Page # 41

Investigation

- Photographs
- Preserve Area
- Collect Statements
- Take Measurements
- Gather Samples
- Complete Accident Report

Accident Investigation Kit

- Camera, extra film, flash attachment
- Clipboard, paper, pencils
- Graph paper (for diagram)
- Ruler and tape measure
- Identification tags (for parts)
- Interview comment sheet (blank paper)
- Personal protective clothing or equipment
- Containers (for material samples)
- Barrier tape or cord (to rope off areas)

Accident Investigation Kit (cont)

- Diagram of a person and list of all body parts involved in the accident. To be completed by injured employee and person conducting the investigation.
- JSA
- Safety Rules
- Phone numbers: injured employee home **(current) ,** EMS, police, sheriff, county disaster services, OSHA, BWC.

Witnesses

- **Keep Witnesses Apart**
- **Interview in a non-threatening location**
- **Put witness at ease (not to point blame)**
- **Ask open ended questions**
- **Document**

Analysis & Conclusions

- **Accident Investigation Forms**
- **Bad Report**
- **Better Report**
- **Accident Tree**

BWC

Accident Investigation Pages #43 - 53

Accident Investigation Kit

- Forms: Acc.Inv. form, Diagram of a person and list of all body parts involved in the accident. To be completed by injured employee and person conducting the investigation.
- Camera, extra film, flash attachment
- Clipboard, paper, pencils
- Graph paper (for diagram)
- Ruler and tape measure
- Identification tags (for parts)
- Interview comment sheet (blank paper)
- Tape recorder
- Personal protective clothing or equipment
- Containers (for material samples)
- Barrier tape or cord (to rope off areas)
- Maintenance Logs
- Training Records
- Length of time on the job and with the company
- JSA
- Safety Rules
- Phone numbers: injured employee home **(current) , EMS, police, sheriff, county disaster services, OSHA, BWC.**

Hazard Assessment (JSA)

Job Safety Analysis

For many years the technique called Job Safety Analysis (JSA) has been a simple but effective means of identifying hazards and potential unsafe work procedures associated with a specific task or job.

The analysis process can be used both to identify hazards and to educate workers in safe procedures. JSA techniques can be a very effective tool for supervisors. The JSA process effectively and efficiently analyzes the job or task and produces detailed information on task-specific accident risks, process improvements and control measures.

When considering where to use the JSA process, analyze first the tasks or jobs having the poorest accident experience or those with the greatest potential for injury. By establishing priorities, the JSA process focuses attention on areas that can have the greatest impact on accident prevention.

Job Safety Analysis provides a systematic means to take advantage of workers' previous experience and knowledge, and it increases employee involvement in establishing safety awareness while developing safe work practices.

Accomplishing these objectives requires that:

- members of management understand the objectives and means of analyzing jobs element by element;
- the JSA process is recognized as an effective tool and incorporated into the regular accident prevention and safety management process;
- a correction process be developed and implemented that responds to identified problems in a timely manner;
- supervisors review the results and take action, if appropriate, on all JSAs completed in their work areas;
- supervisors retain a copy of all approved safe job procedures developed as a result of the JSA process;
- supervisors regularly observe the workers and ensure that safe work practices are being utilized.

In practice, this means the person conducting the Job Safety Analysis must competently assess each job element and identify the potential hazards or risks. Assume, for example, that using a pressurized-water fire extinguisher is the task to be analyzed. (While this is not a work task, it is a well-understood process.) The process might look like this:

1. The first element involves removing the extinguisher from its wall bracket and identifying the potential hazards. Employees should then perform the task, if possible, with the supervisor acting as coach. The supervisor may be required to help until the process proceeds smoothly.

2. Identify each succeeding element (e.g., carrying the extinguisher to the fire) until the entire job has been broken down into its elements. Again, identify the potential hazards, such as the weight of the entinguisher, and slips, trips and falls.

3. After the analysis is complete, list on the JSA form all possible methods or actions associated with the element that would eliminate, reduce or prevent an accident or illness. Agree on which accident prevention techniques will be used. This is the job outline, step by step, and the associated safe work practices that need to be integrated into each step of the job. This completes the JSA process.

To assist the JSA process, a form has been developed. An example of this form is included. A blank form is also provided.

Chapter 23 of the Industry Safety Manual, published by BWC Division of Safety & Hygiene, and the first chapter of Module B in the Safety Works for Industry Seminar Series, discuss ergonomics. Often, a task analysis is used during an ergonomic safety health assessment. The task analysis uses a similar process as the Job Safety Analysis.

JOB SAFETY ANALYSIS

Job Safety Analysis	Job:	Date:
Title of Worker Who Performs Job:	Foreman/Supervisor:	Analysis By:
Department:	Section:	Reviewed By:
Required and/or Recommended Personal Protective Equipment		

Sequence of Basic Job Steps	Potential Accidents or Hazards	Recommended Safe Job Procedures

Job Safety Analysis	Job:	Date:
Title of Worker Who Performs Job:	Foreman/Supervisor:	Analysis By:
Department:	Section:	Reviewed By:

Required and/or Recommended Personal Protective Equipment

Sequence of Basic Job Steps	Potential Accidents or Hazards	Recommended Safe Job Procedures
1. Remove fire extinguisher from wall bracket 2. Carry to fire 3. Operate the unit to extinguish the fire 4. Place extinguisher near exit door of fire area to picked up for servicing	1. Unit is heavy and awkward to handle 2. It weighs 29 lbs. 3. Dropping unit 4. Arm strain 5. Back strain 6. Pinch hand on handle 7. Cut finger on pin 8. Shoot water into face 9. Empty extinguishers are easy to upset 10. If upset, they roll and cause tripping hazards	1. Get a firm grip with both hands before removing to prevent dropping the unit 2. List properly and lower to walking position 3. Be sure you can carry the unit; if you can't, get help 4. Walk briskly to the fire, being alert for slipping and tripping hazards 5. Hold to support extinguisher while removing the safety pin 6. Grip firmly to avoid dropping 7. Be sure discharge is always directed at the fire area 8. Place used extinguisher in approved location 9. Complete any reports required by the company

J S A HIGHLIGHTS

JSA'S ARE USED FOR:

- Accident Investigations
- A tool to analyze jobs/procedures
- Define job steps
- Identify hazards to reduce/eliminate them
- Identify safe practices
- Evaluate process design/equipment layout
- Training tool (new hires/review)
- Transitional work/Job description
- Help profitability

WHO DEVELOPS A JSA?

- Anyone knowledgeable of the job
- Managers
- Supervisors
- Team Leaders
- Employees
- The best choice is the "expert"

PRIORITIZE *(IF BEGINNING A JSA SYSTEM FOR THE FIRST TIME)*

- First priority jobs are those with high accident frequency
- Second priority jobs are those with severe injury or high loss
- Third priority jobs are those with potential to cause severe injury or high loss
- Fourth priority jobs are new jobs without accident history (new equipment/procedures, changes from modifications on new/old equipment)

Division of Safety & Hygiene

DEVELOPING THE JSA

- Develop the job steps first
- Identify the hazards second
- Recommend safe procedures third

Division of Safety & Hygiene

POTENTIAL HAZARDS (Give special attention to FATALITY causes)

- Striking Objects
- Falls
- Burns
- Exertion
- Electrocution
- Caught
- Vehicle Accidents
- Asphyxiation

Division of Safety & Hygiene

MY FIRST JSA ITEM

- (Job Step) Pre-job discussion
- (Potential Hazard) Misuse of equipment can result in damage to equipment, property, and/or injury to operator and bystanders
- (Safe Procedure) Discuss safe procedures, only authorized and properly trained person's may perform this job

Division of Safety & Hygiene

MY LAST JSA ITEM

- (Job Step) Clean up the immediate work area and maintain good housekeeping
- (Potential Hazards) Improper housekeeping could cause slip's, trip's, fall's, and striking objects
- (Safe Procedure) Ensure good housekeeping is maintained and put all tools/equipment in their proper place

Division of Safety & Hygiene

JSA TITLE EXAMPLES

- Operation of Air Compressor
- TIG Welding
- Confined Space Entry (Alternate Entry, PRCSE)
- Elevated Work (above 6')
- Forklift Operation (Moving 55 gal. Drums)
- Operation of Aerial Lift
- Operation of Mechanical Press (#3)
- Operation of Pedestal Grinder
- Changing the Horizontal Band-saw Blade

Division of Safety & Hygiene

COMPLETED JSA

- Review each step to see if the job efficiency can be improved without compromising safety
- Have upper management review and/or approve the JSA
- Ensure each job step has a corresponding “potential hazard” and a “safe procedure”
- Keep the JSA’s accessible for all employees at anytime

Division of Safety & Hygiene

COMPLETED JSA (con’t)

- Training (new/refresher)
- Review
- Laminate & post at the job site/on equipment if possible
- Notebook (remember to keep them current)
- Video tape

Division of Safety & Hygiene

NOTHING IS MORE IMPORTANT!

- Nothing you will do today at work or anywhere, is so important that you should risk your personal safety, or the safety of others, to accomplish it.
- ***YOUR FAMILY IS COUNTING ON YOU!***

Division of Safety & Hygiene

Job Hazard Analysis

OSHA 3071
2002 (Revised)

OSHA
Occupational
Safety and Health
Administration

U.S. Department of Labor

Who needs to read this booklet?

This booklet is for employers, foremen, and supervisors, but we encourage employees to use the information as well to analyze their own jobs and recognize workplace hazards so they can report them to you. It explains what a job hazard analysis is and offers guidelines to help you conduct your own step-by-step analysis.

What is a hazard?

A hazard is the potential for harm. In practical terms, a hazard often is associated with a condition or activity that, if left uncontrolled, can result in an injury or illness. See Appendix 2 for a list of common hazards and descriptions. Identifying hazards and eliminating or controlling them as early as possible will help prevent injuries and illnesses.

What is a job hazard analysis?

A job hazard analysis is a technique that focuses on job tasks as a way to identify hazards before they occur. It focuses on the relationship between the worker, the task, the tools, and the work environment. Ideally, after you identify uncontrolled hazards, you will take steps to eliminate or reduce them to an acceptable risk level.

Why is job hazard analysis important?

Many workers are injured and killed at the workplace every day in the United States. Safety and health can add value to your business, your job, and your life. You can help prevent workplace injuries and illnesses by looking at your workplace operations, establishing proper job procedures, and ensuring that all employees are trained properly.

One of the best ways to determine and establish proper work procedures is to conduct a job hazard analysis. A job hazard analysis is one component of the larger commitment of a safety and health management system. (See page 15 for more information on safety and health management systems.)

What is the value of a job hazard analysis?

Supervisors can use the findings of a job hazard analysis to eliminate and prevent hazards in their workplaces. This is likely to result in fewer worker injuries and illnesses; safer, more effective work methods; reduced workers' compensation costs; and increased worker productivity. The analysis also can be a valuable tool for training new employees in the steps required to perform their jobs safely.

For a job hazard analysis to be effective, management must demonstrate its commitment to safety and health and follow through to correct any uncontrolled hazards identified. Otherwise, management will lose credibility and employees may hesitate to go to management when dangerous conditions threaten them.

What jobs are appropriate for a job hazard analysis?

A job hazard analysis can be conducted on many jobs in your workplace. Priority should go to the following types of jobs:

- Jobs with the highest injury or illness rates;
- Jobs with the potential to cause severe or disabling injuries or illness, even if there is no history of previous accidents;
- Jobs in which one simple human error could lead to a severe accident or injury;
- Jobs that are new to your operation or have undergone changes in processes and procedures; and
- Jobs complex enough to require written instructions.

Where do I begin?

1. **Involve your employees.** It is very important to involve your employees in the hazard analysis process. They have a unique understanding of the job, and this knowledge is invaluable for finding hazards. Involving employees will help minimize oversights, ensure a quality analysis, and get workers to "buy in" to the solutions because they will share ownership in their safety and health program.

2. **Review your accident history.** Review with your employees your worksite's history of accidents and occupational illnesses that needed treatment, losses that required repair or replacement, and any "near misses" — events in which an accident or loss did not occur,
but could have. These events are indicators that the existing hazard controls (if any) may not be adequate and deserve more scrutiny.

3. **Conduct a preliminary job review.** Discuss with your employees the hazards they know exist in their current work and surroundings. Brainstorm with them for ideas to eliminate or control those hazards.

   If any hazards exist that pose an immediate danger to an employee's life or health, take immediate action to protect the worker. Any problems that can be corrected easily should be corrected as soon as possible. Do not wait to complete your job hazard analysis. This will demonstrate your commitment to safety and health and enable you to focus on the hazards and jobs that need more study because of their complexity. For those hazards determined to present unacceptable risks, evaluate types of hazard controls. More information about hazard controls is found in Appendix 1.

4. **List, rank, and set priorities for hazardous jobs.** List jobs with hazards that present unacceptable risks, based on those most likely to occur and with the most severe consequences. These jobs should be your first priority for analysis.

5. **Outline the steps or tasks.** Nearly every job can be broken down into job tasks or steps. When beginning a job hazard analysis, watch the employee perform the job and list each step as the worker takes it. Be sure to record enough information to describe each job action without getting overly detailed. Avoid making the breakdown of steps so detailed that it becomes unnecessarily long or so broad that it does not include basic steps. You may find it valuable to get input from other workers who have performed the same job. Later, review the job steps with the employee to make sure you have not omitted something. Point out that you are evaluating the job itself, not the employee's job performance. Include the employee in all phases of the analysis—from reviewing the job steps and procedures to discussing uncontrolled hazards and recommended solutions.

   Sometimes, in conducting a job hazard analysis, it may be helpful to photograph or videotape the worker performing the job. These visual records can be handy references when doing a more detailed analysis of the work.

How do I identify workplace hazards?

A job hazard analysis is an exercise in detective work. Your goal is to discover the following:

- What can go wrong?
- What are the consequences?
- How could it arise?
- What are other contributing factors?
- How likely is it that the hazard will occur?

To make your job hazard analysis useful, document the answers to these questions in a consistent manner. Describing a hazard in this way helps to ensure that your efforts to eliminate the hazard and implement hazard controls help target the most important contributors to the hazard.

Good hazard scenarios describe:

- Where it is happening (environment),
- Who or what it is happening to (exposure),
- What precipitates the hazard (trigger),
- The outcome that would occur should it happen (consequence), and
- Any other contributing factors.

A sample form found in Appendix 3 helps you organize your information to provide these details.

Rarely is a hazard a simple case of one singular cause resulting in one singular effect. More frequently, many

contributing factors tend to line up in a certain way to create the hazard. Here is an example of a hazard scenario:

> *In the metal shop (environment), while clearing a snag (trigger), a worker's hand (exposure) comes into contact with a rotating pulley. It pulls his hand into the machine and severs his fingers (consequences) quickly.*

To perform a job hazard analysis, you would ask:

- **What can go wrong?** The worker's hand could come into contact with a rotating object that "catches" it and pulls it into the machine.
- **What are the consequences?** The worker could receive a severe injury and lose fingers and hands.
- **How could it happen?** The accident could happen as a result of the worker trying to clear a snag during operations or as part of a maintenance activity while the pulley is operating. Obviously, this hazard scenario could not occur if the pulley is not rotating.
- **What are other contributing factors?** This hazard occurs very quickly. It does not give the worker much opportunity to recover or prevent it once his hand comes into contact with the pulley. This is an important factor, because it helps you determine the severity and likelihood of an accident when selecting appropriate hazard controls. Unfortunately, experience has shown that training is not very effective in hazard control when triggering events happen quickly because humans can react only so quickly.

- **How likely is it that the hazard will occur?** This determination requires some judgment. If there have been "near-misses" or actual cases, then the likelihood of a recurrence would be considered high. If the pulley is exposed and easily accessible, that also is a consideration. In the example, the likelihood that the hazard will occur is high because there is no guard preventing contact, and the operation is performed while the machine is running. By following the steps in this example, you can organize your hazard analysis activities.

The examples that follow show how a job hazard analysis can be used to identify the existing or potential hazards for each basic step involved in grinding iron castings.

Grinding Iron Castings: Job Steps

Step 1. Reach into metal box to right of machine, grasp casting, and carry to wheel.

Step 2. Push casting against wheel to grind off burr.

Step 3. Place finished casting in box to left of machine.

Example Job Hazard Analysis Form

Job Location: Metal Shop	***Analyst***: Joe Safety	***Date:***
Task Description: Worker reaches into metal box to the right of the machine, grasps a 15-pound casting and carries it to grinding wheel. Worker grinds 20 to 30 castings per hour.		
Hazard Description: Picking up a casting, the employee could drop it onto his foot. The casting's weight and height could seriously injure the worker's foot or toes.		
Hazard Controls: 1. Remove castings from the box and place them on a table next to the grinder. 2. Wear steel-toe shoes with arch protection. 3. Change protective gloves that allow a better grip. 4. Use a device to pick up castings.		

***Job Location*:** Metal Shop	***Analyst*:** Joe Safety	***Date:***
***Task Description*:** Worker reaches into metal box to the right of the machine, grasps a 15-pound casting and carries it to grinding wheel. Worker grinds 20 to 30 castings per hour.		
***Hazard Description*:** Castings have sharp burrs and edges that can cause severe lacerations.		
Hazard Controls: 1. Use a device such as a clamp to pick up castings. 2. Wear cut-resistant gloves that allow a good grip and fit tightly to minimize the chance that they will get caught in grinding wheel.		

***Job Location*:** Metal Shop	***Analyst*:** Joe Safety	***Date:***
***Task Description*:** Worker reaches into metal box to the right of the machine, grasps a 15-pound casting and carries it to grinding wheel. Worker grinds 20 to 30 castings per hour.		
***Hazard Description*:** Reaching, twisting, and lifting 15-pound castings from the floor could result in a muscle strain to the lower back.		
Hazard Controls: 1. Move castings from the ground and place them closer to the work zone to minimize lifting. Ideally, place them at waist height or on an adjustable platform or pallet. 2. Train workers not to twist while lifting and reconfigure work stations to minimize twisting during lifts.		

Repeat similar forms for each job step.

Appendix 2
Common Hazards and Descriptions

Hazards	Hazard Descriptions
Chemical (Toxic)	A chemical that exposes a person by absorption through the skin, inhalation, or through the blood stream that causes illness, disease, or death. The amount of chemical exposure is critical in determining hazardous effects. Check Material Safety Data Sheets (MSDS), and/or OSHA 1910.1000 for chemical hazard information.
Chemical (Flammable)	A chemical that, when exposed to a heat ignition source, results in combustion. Typically, the lower a chemical's flash point and boiling point, the more flammable the chemical. Check MSDS for flammability information.
Chemical (Corrosive)	A chemical that, when it comes into contact with skin, metal, or other materials, damages the materials. Acids and bases are examples of corrosives.
Explosion (Chemical Reaction)	Self explanatory.
Explosion (Over Pressurization)	Sudden and violent release of a large amount of gas/energy due to a significant pressure difference such as rupture in a boiler or compressed gas cylinder.
Electrical (Shock/ Short Circuit)	Contact with exposed conductors or a device that is incorrectly or inadvertently grounded, such as when a metal ladder comes into contact with power lines. 60Hz alternating current (common house current) is very dangerous because it can stop the heart.

Hazards	Hazard Descriptions
Electrical (Fire)	Use of electrical power that results in electrical overheating or arcing to the point of combustion or ignition of flammables, or electrical component damage.
Electrical (Static/ESD)	The moving or rubbing of wool, nylon, other synthetic fibers, and even flowing liquids can generate static electricity. This creates an excess or deficiency of electrons on the surface of material that discharges (spark) to the ground resulting in the ignition of flammables or damage to electronics or the body's nervous system.
Electrical (Loss of Power)	Safety-critical equipment failure as a result of loss of power.
Ergonomics (Strain)	Damage of tissue due to overexertion (strains and sprains) or repetitive motion.
Ergonomics (Human Error)	A system design, procedure, or equipment that is error-provocative. (A switch goes up to turn something off).
Excavation (Collapse)	Soil collapse in a trench or excavation as a result of improper or inadequate shoring. Soil type is critical in determining the hazard likelihood.
Fall (Slip, Trip)	Conditions that result in falls (impacts) from height or traditional walking surfaces (such as slippery floors, poor housekeeping, uneven walking surfaces, exposed ledges, etc.)
Fire/Heat	Temperatures that can cause burns to the skin or damage to other organs. Fires require a heat source, fuel, and oxygen.
Mechanical/ Vibration (Chaffing/ Fatigue)	Vibration that can cause damage to nerve endings, or material fatigue that results in a safety-critical failure. (Examples are abraded slings and ropes, weakened hoses and belts.)

Hazards	Hazard Descriptions
Mechanical Failure	Self explanatory; typically occurs when devices exceed designed capacity or are inadequately maintained.
Mechanical	Skin, muscle, or body part exposed to crushing, caught-between, cutting, tearing, shearing items or equipment.
Noise	Noise levels (>85 dBA 8 hr TWA) that result in hearing damage or inability to communicate safety-critical information.
Radiation (Ionizing)	Alpha, Beta, Gamma, neutral particles, and X-rays that cause injury (tissue damage) by ionization of cellular components.
Radiation (Non-Ionizing)	Ultraviolet, visible light, infrared, and microwaves that cause injury to tissue by thermal or photochemical means.
Struck By (Mass Acceleration)	Accelerated mass that strikes the body causing injury or death. (Examples are falling objects and projectiles.)
Struck Against	Injury to a body part as a result of coming into contact of a surface in which action was initiated by the person. (An example is when a screwdriver slips.)
Temperature Extreme (Heat/Cold)	Temperatures that result in heat stress, exhaustion, or metabolic slow down such as hypothermia.
Visibility	Lack of lighting or obstructed vision that results in an error or other hazard.
Weather Phenomena (Snow/Rain/ Wind/Ice)	Self explanatory.

Appendix 3
Sample Job Hazard Analysis Form

Job Title:	*Job Location*:	*Analyst*	*Date*
Task #	*Task Description*:		
Hazard Type:	*Hazard Description*:		
Consequence:	*Hazard Controls*:		
Rational or Comment:			

Self-Inspection Checklists

These checklists are by no means all-inclusive. You should add to them or delete portions or items that do not apply to your operations; however, carefully consider each item as you come to it and then make your decision. You will also need to refer to OSHA standards for complete and specific standards that may apply to your situation. (**NOTE:** These checklists are typical for general industry but not for construction or maritime.)

OSHA Office of Training and Education
May 1997

CONTENTS

SAFETY AND HEALTH PROGRAM

	Do you have an active safety and health program in operation that deals with general safety and health program elements as well as management of hazards specific to your worksite?
	Is one person clearly responsible for the overall activities of the safety and health program?
	Do you have a safety committee or group made up of management and labor representatives that meets regularly and reports in writing on its activities?
	Do you have a working procedure for handling in-house employee complaints regarding safety and health?
	Are you keeping your employees advised of the successful effort and accomplishments you and/or your safety committee have made in assuring they will have a workplace that is safe and healthful?
	Have you considered incentives for employees or workgroups who have excelled in reducing workplace injuries/illnesses?

PERSONAL PROTECTIVE EQUIPMENT

	Are employers assessing the workplace to determine if hazards that require the use of personal protective equipment (for example, head, eye, face, hand, or foot protection) are present or are likely to be present?
	If hazards or the likelihood of hazards are found, are employers selecting and having affected employees use properly fitted personal protective equipment suitable for protection from these hazards?
	Has the employee been trained on ppe procedures, that is, what ppe is necessary for a job task, when they need it, and how to properly adjust it?
	Are protective goggles or face shields provided and worn where there is any danger of flying particles or corrosive materials?
	Are approved safety glasses required to be worn at all times in areas where there is a risk of eye injuries such as punctures, abrasions, contusions or burns?
	Are employees who need corrective lenses (glasses or contacts) in working environments having harmful exposures, required to wear only approved safety glasses, protective goggles, or use other medically approved precautionary procedures?
	Are protective gloves, aprons, shields, or other means provided and required where employees could be cut or where there is reasonably anticipated exposure to corrosive liquids, chemicals, blood, or other potentially infectious materials? See 29 CFR 1910.1030(b) for the definition of "other potentially infectious materials."
	Are hard hats provided and worn where danger of falling objects exists?
	Are hard hats inspected periodically for damage to the shell and suspension system?
	Is appropriate foot protection required where there is the risk of foot injuries from hot, corrosive, or poisonous substances, falling objects, crushing or penetrating actions?
	Are approved respirators provided for regular or emergency use where needed?
	Is all protective equipment maintained in a sanitary condition and ready for use?
	Do you have eye wash facilities and a quick drench shower within the work area where employees are exposed to injurious corrosive materials? Where special equipment is needed for electrical workers, is it available?
	Where food or beverages are consumed on the premises, are they consumed in areas where there is no exposure to toxic material, blood, or other potentially infectious materials?
	Is protection against the effects of occupational noise exposure provided when sound levels exceed those of the OSHA noise standard?

	Are adequate work procedures, protective clothing and equipment provided and used when cleaning up spilled toxic or otherwise hazardous materials or liquids?
	Are there appropriate procedures in place for disposing of or decontaminating personal protective equipment contaminated with, or reasonably anticipated to be contaminated with, blood or other potentially infectious materials?

FLAMMABLE AND COMBUSTIBLE MATERIALS

	Are combustible scrap, debris, and waste materials (oily rags, etc.) stored in covered metal receptacles and removed from the worksite promptly?
	Is proper storage practiced to minimize the risk of fire including spontaneous combustion?
	Are approved containers and tanks used for the storage and handling of flammable and combustible liquids?
	Are all connections on drums and combustible liquid piping, vapor and liquid tight?
	Are all flammable liquids kept in closed containers when not in use (for example, parts cleaning tanks, pans, etc.)?
	Are bulk drums of flammable liquids grounded and bonded to containers during dispensing?
	Do storage rooms for flammable and combustible liquids have explosion-proof lights?
	Do storage rooms for flammable and combustible liquids have mechanical or gravity ventilation?
	Is liquefied petroleum gas stored, handled, and used in accordance with safe practices and standards?
	Are "NO SMOKING" signs posted on liquefied petroleum gas tanks?
	Are liquefied petroleum storage tanks guarded to prevent damage from vehicles?
	Are all solvent wastes and flammable liquids kept in fire-resistant, covered containers until they are removed from the worksite?
	Is vacuuming used whenever possible rather than blowing or sweeping combustible dust? Are firm separators placed between containers of combustibles or flammables, when stacked one upon another, to assure their support and stability?
	Are fuel gas cylinders and oxygen cylinders separated by distance, and fire-resistant barriers, while in storage?
	Are fire extinguishers selected and provided for the types of materials in areas where they are to be used?
	Class A Ordinary combustible material fires.

		Class B Flammable liquid, gas or grease fires.
		Class C Energized-electrical equipment fires.
	Are appropriate fire extinguishers mounted within 75 feet of outside areas containing flammable liquids, and within 10 feet of any inside storage area for such materials?	
	Are extinguishers free from obstructions or blockage?	
	Are all extinguishers serviced, maintained and tagged at intervals not to exceed 1 year?	
	Are all extinguishers fully charged and in their designated places?	
	Where sprinkler systems are permanently installed, are the nozzle heads so directed or arranged that water will not be sprayed into operating electrical switch boards and equipment?	
	Are "NO SMOKING" signs posted where appropriate in areas where flammable or combustible materials are used or stored?	
	Are safety cans used for dispensing flammable or combustible liquids at a point of use?	
	Are all spills of flammable or combustible liquids cleaned up promptly?	
	Are storage tanks adequately vented to prevent the development of excessive vacuum or pressure as a result of filling, emptying, or atmosphere temperature changes?	
	Are storage tanks equipped with emergency venting that will relieve excessive internal pressure caused by fire exposure?	
	Are "NO SMOKING" rules enforced in areas involving storage and use of hazardous materials?	

HAND AND PORTABLE POWERED TOOLS

Hand Tools and Equipment

	Are all tools and equipment (both company and employee owned) used by employees at their workplace in good condition?
	Are hand tools such as chisels and punches, which develop mushroomed heads during use, reconditioned or replaced as necessary?
	Are broken or fractured handles on hammers, axes and similar equipment replaced promptly?
	Are worn or bent wrenches replaced regularly?
	Are appropriate handles used on files and similar tools?
	Are employees made aware of the hazards caused by faulty or improperly used hand tools?
	Are appropriate safety glasses, face shields, etc. used while using hand tools or equipment which might produce flying materials or be subject to breakage?
	Are jacks checked periodically to ensure they are in good operating condition?
	Are tool handles wedged tightly in the head of all tools?
	Are tool cutting edges kept sharp so the tool will move smoothly without binding or skipping?
	Are tools stored in dry, secure locations where they won't be tampered with?
	Is eye and face protection used when driving hardened or tempered spuds or nails?

Portable (Power Operated) Tools and Equipment

	Are grinders, saws and similar equipment provided with appropriate safety guards?
	Are power tools used with the correct shield, guard, or attachment, recommended by the manufacturer?
	Are portable circular saws equipped with guards above and below the base shoe? Are circular saw guards checked to assure they are not wedged up, thus leaving the lower portion of the blade unguarded?
	Are rotating or moving parts of equipment guarded to prevent physical contact?
	Are all cord-connected, electrically operated tools and equipment effectively grounded or of the approved double insulated type?
	Are effective guards in place over belts, pulleys, chains, sprockets, on equipment such as concrete mixers, and air compressors?
	Are portable fans provided with full guards or screens having openings ½ inch or less?
	Is hoisting equipment available and used for lifting heavy objects, and are hoist ratings and characteristics appropriate for the task?
	Are ground-fault circuit interrupters provided on all temporary electrical 15 and 20 ampere circuits, used during periods of construction?
	Are pneumatic and hydraulic hoses on power operated tools checked regularly for deterioration or damage?

Powder-Actuated Tools

	Are employees who operate powder-actuated tools trained in their use and carry a valid operator's card?
	Is each powder-actuated tool stored in its own locked container when not being used?
	Is a sign at least 7 inches by 10 inches with bold face type reading "POWDER-ACTUATED TOOL IN USE" conspicuously posted when the tool is being used?
	Are powder-actuated tools left unloaded until they are actually ready to be used?
	Are powder-actuated tools inspected for obstructions or defects each day before use?
	Do powder-actuated tool operators have and use appropriate personal protective equipment such as hard hats, safety goggles, safety shoes and ear protectors?

LOCKOUT / TAGOUT PROCEDURES

	Is all machinery or equipment capable of movement, required to be de-energized or disengaged and locked-out during cleaning, servicing, adjusting or setting up operations, whenever required?		
	Where the power disconnecting means for equipment does not also disconnect the electrical control circuit:		
		Are the appropriate electrical enclosures identified?	
		Is means provided to assure the control circuit can also be disconnected and locked-out?	
	Is the locking-out of control circuits in lieu of locking-out main power disconnects prohibited?		
	Are all equipment control valve handles provided with a means for locking-out?		
	Does the lock-out procedure require that stored energy (mechanical, hydraulic, air, etc.) be released or blocked before equipment is locked-out for repairs?		
	Are appropriate employees provided with individually keyed personal safety locks?		
	Are employees required to keep personal control of their key(s) while they have safety locks in use?		
	Is it required that only the employee exposed to the hazard, place or remove the safety lock?		
	Is it required that employees check the safety of the lock-out by attempting a startup after making sure no one is exposed?		
	Are employees instructed to always push the control circuit stop button immediately after checking the safety of the lock-out?		
	Is there a means provided to identify any or all employees who are working on locked-out equipment by their locks or accompanying tags?		
	Are a sufficient number of accident preventive signs or tags and safety padlocks provided for any reasonably foreseeable repair emergency?		
	When machine operations, configuration or size requires the operator to leave his or her control station to install tools or perform other operations, and that part of the machine could move if accidentally activated, is such element required to be separately locked or blocked out?		
	In the event that equipment or lines cannot be shut down, locked-out and tagged, is a safe job procedure established and rigidly followed?		

CONFINED SPACES

	Are confined spaces thoroughly emptied of any corrosive or hazardous substances, such as acids or caustics, before entry?
	Are all lines to a confined space, containing inert, toxic, flammable, or corrosive materials valved off and blanked or disconnected and separated before entry?
	Are all impellers, agitators, or other moving parts and equipment inside confined spaces locked-out if they present a hazard?
	Is either natural or mechanical ventilation provided prior to confined space entry?
	Are appropriate atmospheric tests performed to check for oxygen deficiency, toxic substances and explosive concentrations in the confined space before entry?
	Is adequate illumination provided for the work to be performed in the confined space?
	Is the atmosphere inside the confined space frequently tested or continuously monitored during conduct of work? Is there an assigned safety standby employee outside of the confined space. when required, whose sole responsibility is to watch the work in progress, sound an alarm if necessary, and render assistance?
	Is the standby employee appropriately trained and equipped to handle an emergency?
	Is the standby employee or other employees prohibited from entering the confined space without lifelines and respiratory equipment if there is any question as to the cause of an emergency?
	Is approved respiratory equipment required if the atmosphere inside the confined space cannot be made acceptable
	Is all portable electrical equipment used inside confined spaces either grounded and insulated, or equipped with ground fault protection?
	Before gas welding or burning is started in a confined space, are hoses checked for leaks, compressed gas bottles forbidden inside of the confined space, torches lighted only outside of the confined area and the confined area tested for an explosive atmosphere each time before a lighted torch is to be taken into the confined space?
	If employees will be using oxygen-consuming equipment-such as salamanders, torches, and furnaces, in a confined space-is sufficient air provided to assure combustion without reducing the oxygen concentration of the atmosphere below 19.5 percent by volume?
	Whenever combustion-type equipment is used in a confined space, are

	provisions made to ensure the exhaust gases are vented outside of the enclosure?
	Is each confined space checked for decaying vegetation or animal matter which may produce methane?
	Is the confined space checked for possible industrial waste which could contain toxic properties?
	If the confined space is below the ground and near areas where motor vehicles will be operating, is it possible for vehicle exhaust or carbon monoxide to enter the space?

ELECTRICAL

	Do you specify compliance with OSHA for all contract electrical work?
	Are all employees required to report as soon as practicable any obvious hazard to life or property observed in connection with electrical equipment or lines?
	Are employees instructed to make preliminary inspections and/or appropriate tests to determine what conditions exist before starting work on electrical equipment or lines?
	When electrical equipment or lines are to be serviced, maintained or adjusted, are necessary switches opened, locked-out and tagged whenever possible?
	Are portable electrical tools and equipment grounded or of the double insulated type?
	Are electrical appliances such as vacuum cleaners, polishers, and vending machines grounded?
	Do extension cords being used have a grounding conductor?
	Are multiple plug adaptors prohibited?
	Are ground-fault circuit interrupters installed on each temporary 15 or 20 ampere, 120 volt AC circuit at locations where construction, demolition, modifications, alterations or excavations are being performed?
	Are all temporary circuits protected by suitable disconnecting switches or plug connectors at the junction with permanent wiring?
	Do you have electrical installations in hazardous dust or vapor areas? If so, do they meet the National Electrical Code (NEC) for hazardous locations?
	Is exposed wiring and cords with frayed or deteriorated insulation repaired or replaced promptly?
	Are flexible cords and cables free of splices or taps?
	Are clamps or other securing means provided on flexible cords or cables at plugs, receptacles, tools, equipment, etc., and is the cord jacket securely held in place? Are all cord, cable and raceway connections intact and secure?
	In wet or damp locations, are electrical tools and equipment appropriate for the use or location or otherwise protected?
	Is the location of electrical power lines and cables (overhead, underground, underfloor, other side of walls) determined before digging, drilling or similar work is begun?
	Are metal measuring tapes, ropes, handlines or similar devices with metallic thread woven into the fabric prohibited where they could come in contact with

	energized parts of equipment or circuit conductors?
	Is the use of metal ladders prohibited in areas where the ladder or the person using the ladder could come in contact with energized parts of equipment, fixtures or circuit conductors?
	Are all disconnecting switches and circuit breakers labeled to indicate their use or equipment served?
	Are disconnecting means always opened before fuses are replaced?
	Do all interior wiring systems include provisions for grounding metal parts of electrical raceways, equipment and enclosures?
	Are all electrical raceways and enclosures securely fastened in place?
	Are all energized parts of electrical circuits and equipment guarded against accidental contact by approved cabinets or enclosures?
	Is sufficient access and working space provided and maintained about all electrical equipment to permit ready and safe operations and maintenance?
	Are all unused openings (including conduit knockouts) in electrical enclosures and fittings closed with appropriate covers, plugs or plates?
	Are electrical enclosures such as switches, receptacles, and junction boxes, provided with tightfitting covers or plates?
	Are disconnecting switches for electrical motors in excess of two horsepower, capable of opening the circuit when the motor is in a stalled condition, without exploding? (Switches must be horsepower rated equal to or in excess of the motor hp rating.) Is low voltage protection provided in the control device of motors driving machines or equipment which could cause probable injury from inadvertent starting?
	Is each motor disconnecting switch or circuit breaker located within sight of the motor control device?
	Is each motor located within sight of its controller or the controller disconnecting means capable of being locked in the open position or is a separate disconnecting means installed in the circuit within sight of the motor?
	Is the controller for each motor in excess of two horsepower, rated in horsepower equal to or in excess of the rating of the motor it serves?
	Are employees who regularly work on or around energized electrical equipment or lines instructed in the cardiopulmonary resuscitation (CPR) methods?
	Are employees prohibited from working alone on energized lines or equipment over 600 volts?

WALKING-WORKING SURFACES

General Work Environment

	Is a documented, functioning housekeeping program in place?
	Are all worksites clean, sanitary, and orderly?
	Are work surfaces kept dry or is appropriate means taken to assure the surfaces are slip-resistant?
	Are all spilled hazardous materials or liquids, including blood and other potentially infectious materials, cleaned up immediately and according to proper procedures?
	Is combustible scrap, debris and waste stored safely and removed from the worksite properly?
	Is all regulated waste, as defined in the OSHA bloodborne pathogens standard (1910.1030), discarded according to federal, state, and local regulations?
	Are accumulations of combustible dust routinely removed from elevated surfaces including the overhead structure of buildings, etc.?
	Is combustible dust cleaned up with a vacuum system to prevent the dust from going into suspension?
	Is metallic or conductive dust prevented from entering or accumulating on or around electrical enclosures or equipment?
	Are covered metal waste cans used for oily and paint-soaked waste?

Walkways

	Are aisles and passageways kept clear?
	Are aisles and walkways marked as appropriate?
	Are wet surfaces covered with non-slip materials?
	Are holes in the floor, sidewalk or other walking surface repaired properly, covered or otherwise made safe?
	Is there safe clearance for walking in aisles where motorized or mechanical handling equipment is operating?
	Are materials or equipment stored in such a way that sharp projectives will not interfere with the walkway?
	Are spilled materials cleaned up immediately?
	Are changes of direction or elevation readily identifiable?
	Are aisles or walkways that pass near moving or operating machinery, welding operations or similar operations arranged so employees will not be subjected to potential hazards?
	Is adequate headroom provided for the entire length of any aisle or walkway?
	Are standard guardrails provided wherever aisle or walkway surfaces are elevated more than 30 inches above any adjacent floor or the ground?
	Are bridges provided over conveyors and similar hazards?

Floor and Wall Openings

	Are floor openings guarded by a cover, a guardrail, or equivalent on all sides (except at entrance to stairways or ladders)?
	Are toeboards installed around the edges of permanent floor openings (where persons may pass below the opening)?
	Are skylight screens of such construction and mounting that they will withstand a load of at least 200 pounds?
	Is the glass in the windows, doors, glass walls, etc., which are subject to human impact, of sufficient thickness and type for the condition of use?
	Are grates or similar type covers over floor openings such as floor drains of such design that foot traffic or rolling equipment will not be affected by the grate spacing?
	Are unused portions of service pits and pits not actually in use either covered or protected by guardrails or equivalent?
	Are manhole covers, trench covers and similar covers, plus their supports designed to carry a truck rear axle load of at least 20,000 pounds when located in roadways and subject to vehicle traffic?
	Are floor or wall openings in fire resistive construction provided with doors or covers compatible with the fire rating of the structure and provided with a self-closing feature when appropriate?

Stairs and Stairways

	Are standard stair rails or handrails on all stairways having four or more risers?
	Are all stairways at least 22 inches wide?
	Do stairs have landing platforms not less than 30 inches in the direction of travel and extend 22 inches in width at every 12 feet or less of vertical rise?
	Do stairs angle no more than 50 and no less than 30 degrees?
	Are step risers on stairs uniform from top to bottom?
	Are steps on stairs and stairways designed or provided with a surface that renders them slip resistant?
	Are stairway handrails located between 30 and 34 inches above the leading edge of stair treads?
	Do stairway handrails have at least 3 inches of clearance between the handrails and the wall or surface they are mounted on?
	Where doors or gates open directly on a stairway, is there a platform provided so the swing of the door does not reduce the width of the platform to less than 21 inches?
	Where stairs or stairways exit directly into any area where vehicles may be operated, are adequate barriers and warnings provided to prevent employees stepping into the path of traffic?
	Do stairway landings have a dimension measured in the direction of travel, at least equal to the width of the stairway?

Elevated Surfaces

	Are signs posted, when appropriate, showing the elevated surface load capacity?
	Are surfaces elevated more than 30 inches above the floor or ground provided with standard guardrails?
	Are all elevated surfaces (beneath which people or machinery could be exposed to falling objects) provided with standard 4-inch toeboards?
	Is a permanent means of access and egress provided to elevated storage and work surfaces?
	Is required headroom provided where necessary?
	Is material on elevated surfaces piled, stacked or racked in a manner to prevent it from tipping, falling, collapsing, rolling or spreading?
	Are dock boards or bridge plates used when transferring materials between docks and trucks or rail cars?

HAZARD COMMUNICATION

	Is there a list of hazardous substances used in your workplace?		
	Is there a written hazard communication program dealing with Material Safety Data Sheets (MSDS), labeling, and employee training?		
	Is each container for a hazardous substance (i.e., vats, bottles, storage tanks, etc.) labeled with product identity and a hazard warning (communication of the specific health hazards and physical hazards)?		
	Is there a Material Safety Data Sheet readily available for each hazardous substance used?		
	Is there an employee training program for hazardous substances?		
	Does this program include:		
		An explanation of what an MSDS is and how to use and obtain one?	
		MSDS contents for each hazardous substance or class of substances?	
		Explanation of "Right to Know?"	
		Identification of where an employee can see the employers written hazard communication program and where hazardous substances are present in their work areas?	
		The physical and health hazards of substances in the work area, and specific protective measures to be used?	
		Details of the hazard communication program, including how to use the labeling system and MSDS's?	
	Are employees trained in the following:		
		How to recognize tasks that might result in occupational exposure?	
		How to use work practice and engineering controls and personal protective equipment and to know their limitations?	
		How to obtain information on the types selection, proper use, location, removal handling, decontamination, and disposal of personal protective equipment?	
		Who to contact and what to do in an emergency?	

The preceding lists were found May 18, 2000 at
http://www.osha-slc.gov/SLTC/smallbusiness/chklist.html

SAFETY INSPECTION CHECK LIST

Plant or Department: _____

This list is intended only as a reminder. Once specific areas of responsibility have been determined, an inventory should be made of those items that can become unsafe or cause accidents. (Note also whether potential accident causes, marked "X" on previous inspection, have been corrected. These would include:

☒ Unsatisfactory ☑ Satisfactory

1. EMPLOYEE HEALTH
- ☐ Noise
- ☐ Lighting
- ☐ Heating & ventilation
- ☐ Gases, fumes, vapors & dusts
- ☐ _____
- ☐ _____

2. **HAZARDOUS MATERIALS**
- ☐ Corrosives (acids-bases)
- ☐ Compressed Gases
- ☐ Toxic materials or by-products
- ☐ Explosive-flammable
- ☐ Hazardous material warnings
- ☐ _____
- ☐ _____

3. PRODUCTION AND RELATED EQUIPMENT
- ☐ Point-of-operation
- ☐ Drive train guarding
- ☐ Operating controls
- ☐ Equipment maintenance
- ☐ _____
- ☐ _____

4. POWER SOURCE EQUIPMENT
- ☐ Engines and turbines
- ☐ Electric motors
- ☐ Hydraulic pumps
- ☐ _____
- ☐ _____

5. ELECTRICAL EQUIPMENT
- ☐ Switches
- ☐ Breakers
- ☐ Outlets
- ☐ Cables
- ☐ Extension and fixture cords
- ☐ Equipment grounding
- ☐ Temporary wiring
- ☐ _____
- ☐ _____

6. HANDTOOLS
- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____

7. PORTABLE TOOLS
- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____

8. PERSONAL PROTECTIVE EQUIPMENT
- ☐ Face shield
- ☐ Hearing protection
- ☐ Hard hats
- ☐ Safety glasses/goggles
- ☐ Safety shoes
- ☐ Respirators
- ☐ Protective gloves
- ☐ Protective clothing
- ☐ _____
- ☐ _____

9. PERSONAL SERVICE AND FIRST AID FACILITIES
- ☐ Drinking fountains
- ☐ Wash basins
- ☐ Soap dispensers
- ☐ Safety showers
- ☐ Eyewash fountains
- ☐ First aid supplies
- ☐ Stretchers
- ☐ _____
- ☐ _____

10. FIRE PROTECTION & EXTINGUISHING EQUIPMENT
- ☐ "Hot Work" permits
- ☐ Personnel trained
- ☐ Alarms
- ☐ Sprinklers
- ☐ Extinguishers
- ☐ Hydrants & wrench
- ☐ Available water supply
- ☐ Exits marked
- ☐ Fire doors
- ☐ Fire hose & adapters
- ☐ "No Smoking" or "Open Flame" signs
- ☐ Fire Detectors
- ☐ _____
- ☐ _____

11. WALKWAYS AND ROADWAYS
- ☐ Ramps
- ☐ Docks
- ☐ Sidewalks
- ☐ Walkways
- ☐ Aisles
- ☐ Vehicle ways
- ☐ Stairways
- ☐ Standard railings
- ☐ _____
- ☐ _____

(continued on other side)

12. ELEVATORS, ELECTRIC STAIRWAYS, AND MANLIFTS

- ☐ Gates & doors
- ☐ Controls
- ☐ Wire ropes/cables
- ☐ Safety devices
- ☐ Procedures posted
- ☐ Weight limits posted
- ☐ Elevator emergency call devices
- ☐ _____
- ☐ _____

13. WORKING SURFACES

- ☐ Ladders
- ☐ Scaffolds
- ☐ Catwalks
- ☐ Platforms
- ☐ Floors
- ☐ _____
- ☐ _____

14. MATERIAL HANDLING EQUIPMENT

- ☐ Cranes
- ☐ Dollies
- ☐ Conveyors
- ☐ Hoists
- ☐ Forklifts
- ☐ Chains
- ☐ Ropes
- ☐ Slings
- ☐ A-frame
- ☐ Front-end loaders
- ☐ _____
- ☐ _____

15. TRANSPORT EQUIPMENT

- ☐ Automobiles
- ☐ Railroad cars
- ☐ Trucks
- ☐ Motorized carts and buggies
- ☐ _____
- ☐ _____

16. WARNING AND SIGNALING DEVICES

- ☐ Sirens, bells
- ☐ Crossing and blinker lights
- ☐ Klaxons
- ☐ Warning signs
- ☐ Gas/vapor detectors
- ☐ _____
- ☐ _____

17. CONTAINERS

- ☐ Scrap bins
- ☐ Disposal receptacles
- ☐ Carboys
- ☐ Barrels
- ☐ Drums
- ☐ Gas cylinders
- ☐ Solvent cans
- ☐ Tanks
- ☐ _____
- ☐ _____

18. STORAGE FACILITIES AND AREAS BOTH INDOOR AND OUTDOOR

- ☐ Bins
- ☐ Racks
- ☐ Lockers
- ☐ Cabinets
- ☐ Shelves
- ☐ Tanks
- ☐ Closets
- ☐ _____
- ☐ _____

19. STRUCTURAL OPENINGS

- ☐ Windows
- ☐ Doors
- ☐ Stairways
- ☐ Sumps
- ☐ Shafts
- ☐ Pits
- ☐ Floor openings
- ☐ _____
- ☐ _____

20. BUILDINGS AND STRUCTURES

- ☐ Bins
- ☐ Racks
- ☐ Lockers
- ☐ Cabinets
- ☐ Shelves
- ☐ Tanks
- ☐ Closets
- ☐ _____
- ☐ _____

21. PHYSICAL LAYOUT

- ☐ Aisle markings
- ☐ Area designations
- ☐ Blind corners
- ☐ Utility color coding
- ☐ _____
- ☐ _____

22. HOUSEKEEPING

- ☐ Wash and locker rooms
- ☐ Toilets
- ☐ Yards and parking
- ☐ Storage and piling of materials
- ☐ Disposal of waste
- ☐ Pest control
- ☐ _____
- ☐ _____

23. CONFINED SPACE ENTRY PROCEDURES

- ☐ Entry Permit" before entry into confined space
- ☐ Lifeline and observer
- ☐ Respiratory equipment
- ☐ Stand-by equipment
- ☐ _____
- ☐ _____

24. MISCELLANEOUS – Any items that do not fit in preceding categories

- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____

Self-Inspection Checklist

This Checklist is not all-inclusive. The user should add or modify items to fit you specific operations. Use the checklist only as a guide to evaluate safety on your jobsite.

Company Programs:

- ☐ Was OSHA Recordkeeping performed and maintained properly?
- ☐ Was an Accident Investigation Program provided and completed?
- ☐ Was a Fire Prevention plan provided and completed:
- ☐ Was a Safety & Health plan provided and completed?
- ☐ _____

Temporary Storage:

- ☐ Was there improper storage of material near an opening?
  Location(s): _____
- ☐ Was there an excessive accumulation of debris?
  Location(s): _____
- ☐ Were upturned nails observed?
  Location(s): _____
- ☐ _____

Personal Protective Equipment:

- ☐ Was proper PPE provided for employees?
  Location(s): _____
- ☐ Was eye protection with side shields provided?
  Location(s): _____
- ☐ Was PPE maintained and stored properly??
  Location(s): _____
- ☐ Was fall protection provided and used?
- ☐ _____

Floors, Stairways and Ladders

- ☐ Was an unguarded opening observed?
  Location(s): _____
- ☐ Were all railing systems substantial?
  Location(s): _____
- ☐ Were toeboards in place?
  Location(s): _____
- ☐ Were stairs properly equipped with handrails?
  Location(s): _____
- ☐ Were elevated walkways/runways guarded?
  Location(s): _____
- ☐ Were damaged ladders in use?
  Location(s): _____
- ☐ Were ladders properly used and maintained?
  Location(s): _____
- ☐ Were job made ladders constructed properly?
  Location(s): _____
- ☐ _____

Mechanical Power Transmission Apparatus and Hand/Power Tools:

- ☐ Were power actuated tools properly used?
  Location(s): _____
- ☐ Were all vee belts and pulleys properly guarded?
  Location(s): _____
- ☐ Were all saws properly guarded?
  Location(s): _____
- ☐ Were damaged hand tools in use?
  Location(s): _____
- ☐ _____

Motor Vehicles and Mechanized Equipment:

- ☐ Were "Shut off engine" signs posted?
  Location(s): _____
- ☐ Was mobile equipment equipped with reverse alarm?
  Location(s): _____
- ☐ Were smoking/open flames observed in the refueling area?
  Location(s): _____
- ☐ _____

Cranes, Hoists and Equipment:

- ☐ Were inspection records kept for a mobile crane?
  Location(s): _____
- ☐ Was a crane load rating chart provided?
  Location(s): _____
- ☐ Was a suspended platform properly used and maintained?
  Location(s): _____
- ☐ Was a crane boom indicator provided?
  Location(s): _____
- ☐ Was a barricade provided for a crane rotating structure?
  Location(s): _____
- ☐ Was the equipment too close to overhead power lines?
  Location(s): _____
- ☐ Were mobile scaffolds provided with locking wheels/casters?
  Location(s): _____
- ☐ _____

Scaffolds:

- ☐ Were scaffolds properly used and maintained?
  Location(s): _____
- ☐ Were any scaffold components defective?
  Location(s): _____
- ☐ Did scaffolds have required guardrailing?
  Location(s): _____
- ☐ Was safe access provided?
  Location(s): _____
- ☐ Was a mobile scaffold taller than three times the base dimension?
  Location(s): _____
- ☐ Were mobile scaffolds provided locking wheels/casters?
  Location(s): _____
- ☐ _____

Trenches:

- ☐ Was a trench properly guarded against collapse?
  Location(s): _____
- ☐ Were daily inspections conducted by a competent person?
  Location(s): _____
- ☐ Were estimated locations of utilities determined?
  Location(s): _____
- ☐ Was spoil material too close to the edge of the trench?
  Location(s): _____
- ☐ Were employees wearing reflective vests when exposed to public traffic?
  Location(s): _____
- ☐ Did a trench over four feet deep have an egress ladder?
  Location(s): _____
- ☐ _____

Electrical Systems:

- ☐ Were main and secondary feed conductors elevated eight feet?
  Location(s): _____
- ☐ Were covers and faceplates provided?
  Location(s): _____

Electrical Equipment:

- ☐ Were GFCIs provided in required areas?
  Location(s): _____
- ☐ Were all outlets properly grounded?
  Location(s): _____
- ☐ Were all extension cords properly grounded and in good repair?
  Location(s): _____
- ☐ Was all cord and plug connected equipment properly grounded?
  Location(s): _____
- ☐ Were metal knockout boxes used in a portable situation?
  Location(s): _____
- ☐ Were temporary lights supported by an electrical cord?
  Location(s): _____
- ☐ Were all energized parts properly guarded?
  Location(s): _____
- ☐ _____

Cutting and Welding:

- ☐ Were oxygen and fuel gas cylinders secured and stored properly?
  Location(s): _____
- ☐ Were all cylinders equipped with valve protection caps?
  Location(s): _____
- ☐ Were cables or hoses damaged?
  Location(s): _____
- ☐ Were gauges damaged?
  Location(s): _____
- ☐ Was welding performed near combustibles?
  Location(s): _____
- ☐ Were temporary lights supported by an electrical cord?
  Location(s): _____
- ☐ _____

Demolition:

- ☐ Was an engineering survey done prior to the demolition?
  Location(s): _____
- ☐ Was the below dumping area barricaded?
  Location(s): _____
- ☐ Was the debris chute in proper working condition?
  Location(s): _____
- ☐ _____

Steel Erection:

- ☐ Were loads placed on unsecured joints?
  Location(s): _____
- ☐ Were tag lines used?
  Location(s): _____
- ☐ Were all extension cords properly grounded and in good repair?
  Location(s): _____
- ☐ Were employees properly protected while working at heights greater than 25 feet?
  Location(s): _____
- ☐ _____

Fire Extinguishers:

- ☐ Were fire extinguishers provided in required areas?
  Location(s): _____
- ☐ Were all inspections performed?
  Location(s): _____
- ☐ Were fire extinguishers properly charged?
  Location(s): _____
- ☐ _____

Miscellaneous:

- ☐ Was there an attendant at the tar kettle?
  Location(s): _____
- ☐ Were emergency telephone numbers posted?
  Location(s): _____
- ☐ Were employees observed eating, drinking or smoking in work areas?
  Location(s): _____
- ☐ Were all containers labeled?
  Location(s): _____
- ☐ Were unapproved safety containers in use?
  Location(s): _____
- ☐ Were protruding rebars observed?
  Location(s): _____
- ☐ Were general housekeeping habits applied?
  Location(s): _____
- ☐ Was a sold fuel salamander in use inside a building?
- ☐ _____

Notes:

Saving You Time and Research

Requests for copies of OSHA standards, information on starting a safety committee, a video on accident investigation techniques -- these are some of the thousands of inquiries BWC's Division of Safety & Hygiene (DSH) libraries receive each year.

DSH has two libraries to serve you:

- The central library in the William Green Building in downtown Columbus;
- The resource center and video library located at the Ohio Center for Occupational Safety and Health (OCOSH) in Pickerington.

Both libraries are open 8 a.m. to 4:45 p.m., Monday through Friday. Your need for information does not require a visit to the library. You can phone, fax, or e-mail your requests and receive a quick response.

The central library provides free information services on the topics of occupational safety and health, workers' compensation and rehabilitation.

The OCOSH resource center provides similar services for those who visit OCOSH for meetings and training center classes.

The video library offers an extensive collection of videotapes to supplement your organization's safety and health training program. It is a convenient and popular source for Ohio employers to borrow quality occupational safety- and health-related training aids.

Visit our Web site at **www.ohiobwc.com.**

Central library
30 W. Spring St., Third Floor
Columbus OH 43215-2256
1-800-OHIOBWC
(614) 466-7388
(614) 644-9634 (fax)
library@bwc.state.oh.us

OCOSH resource center
13430 Yarmouth Drive
Pickerington OH 43147
1-800-OHIOBWC
Resource center (614) 728-6464
Video library (614) 644-0018

INTERNET WEB SITES
FOR
OCCUPATIONAL SAFETY & HEALTH INFORMATION
April 2005

GENERAL

NATIONAL SAFETY COUNCIL (NSC)
http://www.nsc.org/

The NSC has a user friendly web site for innovative and current information on home, farm and community, on the road and workplace safety and as well statistical data and charts.

NORTH DAKOTA WORKFORCE SAFETY & INSURANCE
http://www.workforcesafety.com/

For workplace safety, North Dakota's WSI site puts forth their "safe operating procedures" page where they give information on accident and near miss reports, substance abuse, material handling and storage, walking and working surfaces, and safety program development and orientation.

OCCUPATIONAL & INDUSTRIAL SAFETY RESOURCES
http://www.khake.com/page59.html

Maintained by a Vocational Information Center, this web site provides links to occupational and industrial safety with lists of directories, national centers, hotlines and help lines as well as specific area coverage such as emergency, disaster and natural hazards, and tool, machine and equipment safety options.

OKLAHOMA STATE UNIVERSITY
http://www.pp.okstate.edu/ehs/

The Department of Environmental Health & Safety at OSU offers an online safety resource library that is constantly being updated with topics from A-Z including specific areas of safety such as fire, construction, HAZCOM and training. Go to the "Links Library" option.

SAFETY DIRECTORY
http://www.safetydirectory.com/

Safety Directory.com is an Internet gateway to occupational health & safety sites. This web site is indexed with information on industry specific topics, training, illness and injury, as well as safety publications and resources.

FEDERAL GOVERNMENT

CENTERS FOR DISEASE CONTROL & PREVENTION (CDC)
http://www.cdc.gov/

The CDC is always a good resource for current medical issues throughout the United States. Health topics from A-Z give an in-depth look at most communicable diseases as well as topics such as safe driving, violence, and air pollution, and workplace safety and health topics.

FEDERAL EMERGENCY MANAGEMENT ASSOCIATION (FEMA)
http://www.fema.gov/

For up-to-date information on active disasters and emergencies nationwide access this web site first. Publications include options for emergency preparedness and prevention, response and recovery, disaster fact sheets, and public awareness information.

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY & HEALTH (NIOSH)
http://www.cdc.gov/niosh/homepage.html

NIOSH's web site provides current information on many services as well as safety research, including ergonomics programs, respirators, and mining safety. At the chemical page you will find databases and other helpful resources, information on personal protective equipment, as well as government agency web sites of interest.

OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA)
http://www.osha.gov

OSHA'S official web site includes media releases, online publications, statistics, standards & directives, "Technical Links," training center courses, "hot topics," and "what's new" as well a very useful A-Z index page.

INTERNATIONAL RESOURCES

HEALTH & SAFETY EXECUTIVE (HSE)
http://www.hse.gov.uk/

The United Kingdom has an international safety web site with a good deal to offer on occupational safety & health. Drop down boxes offer A-Z industry information, health and safety topics, tools, research, as well as publications and statistics.

ERGNET
http://www.sunderland.ac.uk/~ts0gli/ergnet.htm

The University of Sunderland in the UK is an international web site directory of "places for ergonomics and human factors". Featuring lists of sources such as societies, organizations, government bodies, institutes, centers and laboratories, this site also gives links to journals, a research database and other general ergonomic sites.

OHIO

OHIO EPA (OEPA)

http://www.epa.state.oh.us

At the official web site for Ohio's Environmental Protection Agency; use the "Topic Index" to find regulations and information on permits, hazardous waste, pollution prevention, wastewater, wetlands, and much more.

OHIO STATE LIBRARY/OHIOLINK
http://winslo.state.oh.us

At **OhioLink**, a statewide library and information network, you can search the State Library of Ohio's collection for the BWC's Division of Safety & Hygiene library books as well as other Ohio College and university library collections. Also available at this web site are searchable versions of Ohio Administrative laws and rules, electronic databases, and other Ohio library directories.

SPECIFIC (BY SUBJECT)

CONSTRUCTION
http://www.cdc.gov/elcosh/index.html

CDC's **eLCOSH** is a comprehensive library of construction-related safety information presented in both English and Spanish with items listed under trade, hazard, job site, and others. Also see: The Construction Industry Safety Council, a Center to Protect Workers' Rights resource center at ***http://www.buildsafe.org/RSC.htm*** for OSHA publications in PDF and hazard alerts.

ERGONOMICS
http://www.ergoweb.com

ERGOWEB provides current information on ergonomics and human factor science. Offered are: research, case studies, reference material and a forum for questions, answers and discussion.

LABORATORY SAFETY
http://safety.science.tamu.edu/

Texas A&M University College of Science is an optional choice for safety in the laboratory information. From hazard identification to waste disposal this web site offers thorough coverage of laboratory safe practices.

MATERIAL SAFETY SHEETS
http://www.ilpi.com/msds/index.html

This web site offers many solutions for finding MSDS (100 free sites) as well as chemical manufacturers and suppliers, pesticides including fertilizers, government sites, and other miscellaneous locations for chemical data. Also check any toxicological effects at *http://www.atsdr.cdc.gov/toxprofiles/* and health and safety information on household chemical ingredients at *http://householdproducts.nlm.nih.gov/*.

MOTOR CARRIER SAFETY PROGRAMS

http://www.fmcsa.dot.gov/safetyprogs/saftprogs.htm

The Federal Motor Carrier Safety Administration (FMCSA), an administration within the U.S. Department of Transportation, regulates and supports the Nation's interstate commercial carrier industry. The FMCSA web page offers several safety programs in PDF format such as brake safety, fatigue, HAZMAT safety, speed management, sharing the road safely, and other insurance and licensing information.

RADIATION
http://www.physics.isu.edu/radinf/

The Radiation Information Network offers a web site that is in-depth with information on radiation topics and issues. In addition to what's new in the field and general information there are regulatory, organizational and society links as well as research and educational resources available to access.

SAFETY STATISTICS
http://stats.bls.gov/

Occupational health and safety statistics by industry and occupation can be researched for injuries, illnesses, and fatality data at this web site starting with the "Overview of BLS Statistics on Worker Safety and Health" page.

SAFETY BRIEFINGS, MANUALS, PRODUCTS & PROGRAMS

OSHA POWERPOINT SAFETY PRESENTATIONS
http://esf.uvm.edu/sirippt/powerpt.html

An extensive safety PowerPoint presentation library is available at this web site featuring A-Z topics such as accident investigations, bomb threats, chemical spills, construction, electrical, hand tools, emergency response, fire safety, forklifts, JSA, laser, OSHA compliance, PPE, razor knife safety, safe lifting, and many more.

SAFETY PUBLICATIONS & VIDEO RESOURCES
http://www.cbs.state.or.us/external/osha/standards/pub.htm

A valuable resource for safety resources, the Oregon State's Department of Consumer and Business Publications web site is packed with downloadable information. Areas covered are agriculture, asbestos abatement, occupational exposures, HAZCOM, HAZMAT, HAZWOPER, safety practices, writing manuals and programs, tools of the trade, workers' compensation and ergonomics.