

Job Safety Analysis



Introduction

Job Safety Analysis

Table of Contents

<u>Tab</u>	<u>Page</u>
Introduction	
Objectives	2
Agenda	3
BWC Office Locations	4
Introduction Slides	5
PowerPoint	9
Content	
JSA Educational Material	25
Job Hazard Control Plan	32
Job Safety Analysis Review Checklist	36
Sample Approved JSA	39
Typical Errors on JSA	40
Sample Job Hazard Analysis	41
Downloading Materials (one-hour presentation) from Web	42
Resources	
Additional Resources	43
JSA Planning Sheet	45
Hazard Identification Checklist	46
Questions to Ask When Determining Controls	48
National Safety Council JSA & Directions	49
PNW/APS Safety Performance	51
OSHA Job Safety Analysis	55
JSA Forms	81

Job Safety Analysis

Objectives

You will learn:

- A proactive approach to incident prevention and safety;
- The purpose and benefits of a JSA;
- Techniques for performing a JSA;
- How to conduct and document a JSA;
- How to analyze the results of your JSA;
- How to implement your safe job procedures;
- How to manage and maintain your JSA process.

Job Safety Analysis

Agenda

8:30 am - 11:30 am

- Introductions
- What do you want to take away from class?
- Review material in book
- How to do a JSA
- Video and group discussion of video afterwards

11:30 am - 12:30 pm

- Lunch

1:30 pm - 3:30 pm

- JSA practical exercises
- Group discussion of and explanation of results of exercises: corrective actions, identifying steps, and identifying hazards.

3:30 pm - 4:30 pm

- Review session
- Website demos
- Q&A
- Evaluations

BWC Office Locations

**Ohio Center for
Occupational Safety &
Health (OCOSH)**
13430 Yarmouth Drive
Pickerington, OH 43147
1-800-OHIO BWC
(Follow the prompts)
(614) 995-8622
Safety@bwc.state.oh.us

Cambridge
61501 Southgate
Parkway
Cambridge, OH 43725
(740) 435-4210

Canton
400 Third St. S.E.
PO Box 24801
Canton, OH 44701-
4801
(330) 471-0397

Cleveland
615 W. Superior Ave.
6th Floor
Cleveland, OH 44113
(216) 787-3060

Columbus
30 W. Spring St.
11th Floor
Columbus, OH 43215
(614) 752-4538

Dayton
3401 Park Center Drive
PO Box 13910
Dayton, OH 45414
(800-862-7768
(937) 264-5230

Garfield Heights
4800 E. 131st St.
Garfield Heights, OH
44105
(216) 584-0115

Governor's Hill
8650 Governor's Hill Dr.
4th Floor
Cincinnati, OH 45249
(513) 583-4403

Hamilton
One Renaissance
Center
345 High St.
Hamilton, OH 45011
(513) 785-4510

Lima
2025 E. Fourth St.
Lima, OH 45804
(419) 227-4116

Logan
1225 W. Hunter St.
Logan, OH 43138
(740) 385-9848

Mansfield
240 Tappan Drive N.
PO Box 8051
Mansfield, OH 44906
(419) 529-4528

Portsmouth
1005 Fourth St.
PO Box 1307
Portsmouth, OH 45662
(740) 353-3419

Springfield
1 S. Limestone St.
PO Box 1467
Springfield, OH 45501
(937) 327-1365

Toledo
1 Government Center
12th Floor
Toledo, OH 43604
(419) 245-2474

Youngstown
242 Federal Plaza W.
Suite 200
Youngstown, OH 44503
(330) 797-5010

Ohio BWC

Job Safety / Hazard Analysis

SIGN IN SHEET

Please check these for accuracy:

- * Address
- * Telephone number
- * Company name
- * E-mail address

Is everything spelled correctly?
Don't forget your signature!

NAME TENT

Please **PRINT**
your name
BIG

GENERAL OVERVIEW



BREAKROOM

- * Pay Phones
- * Message Board
- * Coffee 
- * Vending Machines 
- * Refrigerator
- * Can Recycling 



CELL PHONES

CELL CITATION	
EVERYBODY CAN HEAR YOU NOW <small>By bothering those around you with your inconsiderate cell phone usage, you are contributing to toxicity, noise pollution, and dangerous distraction.</small>	
INFRACTION	
GENERAL	RING
<input type="checkbox"/> Shouting/loudness	<input type="checkbox"/> Annoying novelty ring
<input type="checkbox"/> Lack of consideration	<input type="checkbox"/> Overly loud ring
<input type="checkbox"/> Disturbing the peace	<input type="checkbox"/> Bad ringing judgment
<input type="checkbox"/> Poor multi-tasking	<input type="checkbox"/> Incessant ringing
CONVERSATION	ENVIRONMENT
<input type="checkbox"/> Forced bystander listening	<input type="checkbox"/> Disregard for surroundings
<input type="checkbox"/> Talking too long	<input type="checkbox"/> Invasion of personal space
<input type="checkbox"/> Airing dirty laundry	<input type="checkbox"/> Inappropriate location
<input type="checkbox"/> Painfully banal subject(s)	<input type="checkbox"/> Violating "NO CELL" rule
REMEDY	
<input type="checkbox"/> Hang up	<input type="checkbox"/> Consider others
<input type="checkbox"/> Turn off ringer	<input type="checkbox"/> Apologize
	<input type="checkbox"/> Impound phone
	<input type="checkbox"/> Seek therapy

RESTROOMS



OCOSH LIBRARIES



Library



DVD and Video Library



COURSE OBJECTIVES

- Introduce Job Hazard Analysis .
- Introduce Some Basic Skills in the Recognition & Control of Occupational Hazards.
- Introduce Job Hazard Analysis Techniques.

JOB SAFETY ANALYSIS

Job Safety Analysis

What is it?

Process of studying and recording each step of a job, identifying existing or potential hazards, and determining the best way to perform the job to reduce or eliminate the hazards.

JSA

JSA is used to determine:

- Physical, procedural, and/or environmental based hazards that do or could exist
- Actions of personnel which could result in accidents or injuries
- Measures to be implemented which will eliminate or control hazards so the job can be performed safely

Elements of JSA

Four basic steps:

1. Selecting jobs for analysis
2. Breaking each selected job into steps
3. Identify the hazards associated with each step
4. Eliminate or correct the hazards

JOB SAFETY ANALYSIS

JSA Benefits

- Prevention/reduction of hazards in the performance of your job
- Prevention/reduction of occurrences of accidents
- Improvements in job performance
- Coordinates with PPE selection, Ergonomic assessments, complying with ADA
- Standardizes work procedures

More Benefits

- # Employee training
- # Identify jobs for return to work program
- # Employee orientation
- # Job reviews
- # Document corrections and improvements
- # Safety Audits
- # Accident Investigations

OSHA Requirements

- # General Duty Clause 5(a)(1)
- # Many OSHA Standards require hazard analysis:
 - EAP
 - Hazcom
 - PPE
 - LOTO

JOB SAFETY ANALYSIS

When Should JSA Be Created

- # JSA should be performed when:
 - Job does not currently have JSA
 - New job is created
 - When accident or near miss occurs
 - When employee has concern

Members of JSA Team

- # No single method
- # Typical members:
 - Safety manager
 - Safety team members
 - Employees
 - Supervisors
 - Human Resources
 - Engineering

Employee Involvement

- # Reasons for involving employees:
 - Familiarity
 - Identify hazards not observable
 - Avoids alienation
 - Gains “buy-in” for necessary changes

JOB SAFETY ANALYSIS

Employee Involvement

- # Discuss process with employees performing the job and explain purpose
- # Involve employee in all phases after job selection
- # Higher success rates
- # More effective JSA results

Resistance

- # Departmental managers may not fully cooperate because:
 - Process seen as a disruption to their work area
 - Employee involvement detrimental to productivity
- # Overcome by communicating benefits of JSA and involving management members in the process

Approaches to JSA

Observation Method

- # Directly observe the job task, to evaluate each step and understand the hazards involved.
- # Ask questions of the operators and draw upon their knowledge of established procedures, problems, and difficult areas

Preferred Method

Approaches to JSA continued

Discussion Method

- # Requires getting people together who have knowledge of the job and discuss a particular job task.
- # Job analysis is not done at the site of the job. Some points could be missed.

Secondary Method

What is a Job?

What is a Job?

- # A **JOB** is a description of a function in the company
 - Supervisor; Assembler; Material Handler
- # Each job is made up of **TASKS**.

JOB SAFETY ANALYSIS

Examples of Tasks

- # **TASK** – sequence of steps or activities that together accomplish a goal.
 - Hanging a door
 - Unloading drums from truck with forklift
 - Filling cans on an assembly line
 - Machining parts in a mill

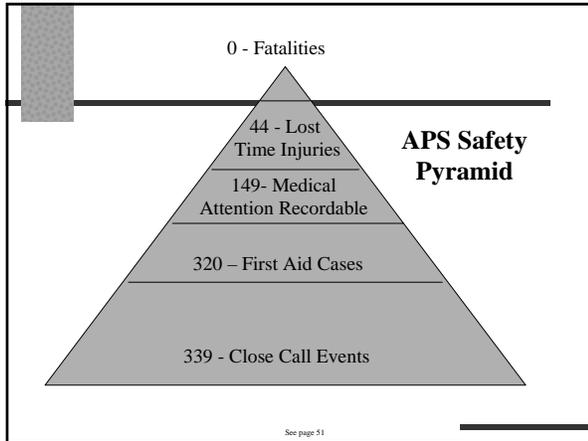
Step 1: Selecting Jobs for JSA

- # High risk jobs first
- # Indicators used to select jobs:
 - Frequency
 - Severity
 - Potential Severity

Materials to Aid in Job Selection

- # Accident reports
- # OSHA logs
- # Workers' Compensation claims

JOB SAFETY ANALYSIS



Step 2: Job Task Breakdown

- # List each step of the job in order of occurrence as you watch the employee perform the job.
- # Don't break the job down into steps so small as to be meaningless or too broad that something is missed.

Tools and equipment

- # Video camera
- # Digital Camera
- # Tape recorder
- # Notebook
- # Employee Interview
- # Supervisor Interview

JOB SAFETY ANALYSIS

JSA Video



Job Safety Analysis Worksheet

Company: _____ Plant Location: _____ Date Filed: / /

Page ___ of ___ Date of Analysis: / / Original
Repeat

Job Task(s) Name: _____ Supervisor: _____ Analysis By: _____

Employee(s) Performing the Job: _____ Department: _____ Reviewed By: _____

Personal Protective Equipment: _____

Sequence of Basic Job Steps	Hazards Associated with Task	Possible Solutions to Hazards	Assigned to

See page 81

Planting A Tree (example 1)

1. Dig hole.
2. Insert tree.
3. Backfill planting.

What's wrong with this?



JOB SAFETY ANALYSIS

Planting A Tree (example 2)

1. Pick up shovel
2. Position shovel
3. Put foot on shovel
4. Push shovel with foot.
5. Etc.



What's wrong with this?

Planting A Tree (example 3)

1. Bring tools
2. Dig hole
3. Prepare hole
4. Position tree in hole
5. Backfill, tamp, and water
6. Brace tree
7. Return tools



Rule of Thumb

- Most jobs will separate into 10-15 basic steps, although some will have fewer and some may have more.

JOB SAFETY ANALYSIS

Employee Interviews

- # Conduct interview near work area
- # Explain only looking for facts
- # Ask open ended questions
- # Ask employee to write down job steps
- # Thank person for helping

Information Review

- # Using information gathered, including employee interview, review and revise job steps as necessary to accurately reflect current performance of job.

Step 3: Identifying Hazards

- # Recorded steps must be examined to determine hazards that exist or might occur.
- # Identification of hazards should include the hazards associated with: machines, tools, supplies, job procedures, and the surroundings

JOB SAFETY ANALYSIS

Job Safety Analysis Worksheet

Company: _____ Plant Location: _____ Date Filed: / /

Job Task(s) Name:	Page ____ of ____	Date of Analysis: / /	Original <input type="checkbox"/> Repeat <input type="checkbox"/>
Employee(s) Performing the Job:	Supervisor:	Analysis By:	
Personal Protective Equipment:	Department:	Reviewed By:	

Sequence of Basic Job Steps	Hazards Associated with Task	Possible Solutions to Hazards	Assigned to

See page 81

Hazard Types

1. Contact by or against objects.
2. Caught in or between objects
3. Falls same level.
4. Falls elevation.
5. Overexertion.
6. Environmental exposure

Hazard Checklist

<p>Equipment:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Fire <input type="checkbox"/> Mechanical <input type="checkbox"/> Pneumatic <input type="checkbox"/> Electrical <input type="checkbox"/> Hydraulic <input type="checkbox"/> Machine guarding 	<p>Environment – Chemical:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Inhalation <input type="checkbox"/> Absorption <input type="checkbox"/> Ingestion <input type="checkbox"/> Injection
---	--

See page 46

JOB SAFETY ANALYSIS

Hazard Checklist continued

Environment – Physical:

- ☒ Slip, trip, or fall
- ☒ Caught in, on, or between
- ☒ Overexertion (while lifting, pulling, pushing, bending)
- ☒ Vibration
- ☒ Struck by or struck against
- ☒ Noise
- ☒ Contact with extreme heat, extreme cold, electrical current
- ☒ Material handling

See page 46

Hazard Checklist continued

Environment – Ergonomic:

- ☒ Poor work environment
- ☒ Poor lighting
- ☒ Poor tool design
- ☒ Incorrect tools
- ☒ Repeated motion in awkward positions
- ☒ Poor workstation layout

See page 46

Additional Training

- ☒ Do JSA Team Members need additional training in hazard recognition?
 - Know difference between physical and health hazards?
 - Understand basic electrical principles?
 - Understand hazards of extreme hot or cold environments?

JOB SAFETY ANALYSIS

Step 4: Controls

- After hazards or potential hazards have been listed and reviewed, the next step is
 - eliminate the hazards, or
 - reduce the hazards.

Job Safety Analysis Worksheet			
Company: _____		Plant Location: _____	
Date Filed: / /		Page ____ of ____	
Job Task(s) Name: _____		Date of Analysis: / /	
Employee(s) Performing the Job: _____		Supervisor: _____	
Personal Protective Equipment: _____		Department: _____	
Analysis By: _____		Reviewed By: _____	
Sequence of Basic Job Steps	Hazards Associated with Task	Possible Solutions to Hazards	Assigned to

See page 81

Controls

- Substitution
- Job Redesign
- Engineering Revisions
- Procedural Revisions
- Personal Protective Equipment
- Training
- Administration Controls

JOB SAFETY ANALYSIS

Investigation Guide

The following guide helps identify the root causes when they are conditions or actions. By answering the questions, you can get to the "root" of things when an accident occurs.

If the cause appears to be ...

A CONDITION	AN ACTION
Why did it exist? Why had no one noticed and corrected it?	Why was it being done? Why was it being done this way? Why was it (job or detail) necessary?
What caused it to exist? What caused it to be involved?	What was its purpose? What other way could it be done? What details could be eliminated? What instructions were not followed?
Where was it? Where was its source? Where else does it exist? Where can I find out?	Where should it be done? Where else is it being done?
When did it occur? When do similar conditions occur?	When should it be done?
Who was responsible for it? Who can give me answers? Who should take corrective action?	Who is best qualified to do it? Who can give me answers? Who can show me what was being done?
How should it be corrected? How can it be avoided in the future?	How is the best way to do it? How can it (job or detail) be improved?

See page 37

Hierarchy of Hazard Correction

<input checked="" type="checkbox"/> ENGINEERING CONTROLS	→ FIRST CHOICE
<ul style="list-style-type: none"> ✓ Work Station Design ✓ Tool Selection and Design ✓ Process Modification ✓ Mechanical Assist 	
<input checked="" type="checkbox"/> ADMINISTRATIVE CONTROLS	→ SECOND CHOICE
<ul style="list-style-type: none"> ✓ Training Programs ✓ Pacing ✓ Job Rotation/Enlargement ✓ Policy and Procedures 	
<input checked="" type="checkbox"/> PERSONNEL PROTECTIVE EQUIPMENT	→ LAST CHOICE
<ul style="list-style-type: none"> ✓ Gloves ✓ Shields ✓ Non-Slip Shoes ✓ Wraps ✓ Eye Protection ✓ Aprons 	

Hierarchy of Hazard Correction

✚ Use Procedures for safe work which are understood and followed by all parties, as a result of

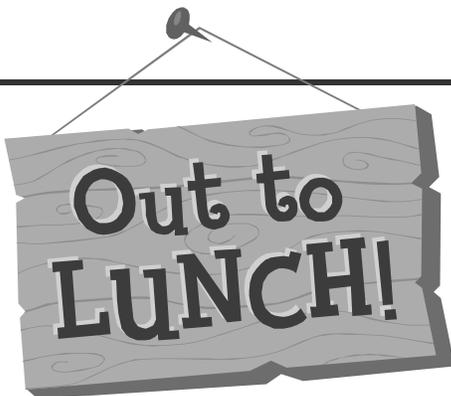
- training,
- positive reinforcement,
- correction of unsafe performance, and
- enforcement through a clearly communicated disciplinary system

Reviewing/Revising JSAs

- JSA are only effective if they are reviewed and updated periodically.
- Trigger points:
 - When accidents occur
 - When the job process changes
 - After near misses
 - Employee complaint
 - Equipment suffers damage
 - Periodic Reviews

Conclusion

- The process of JSA can be applied to any job in any workplace, to improve work procedures and make jobs safer and easier to perform.
- The goal of this process is to educate everyone by getting them involved in identifying hazards and developing controls to keep everyone safe.



Content

Why Use the Job Safety or Hazard Analysis (JSA/JHA) ?

- Establishes the safe way to each job. Identifies and eliminates or controls task hazards before they cause injuries or damage. Can be used as a “best method”
- Can be used as an orientation and training and retraining tool
- Gives supervisors an objective set of criteria to monitor and appraise performance and provide feedback and documentation
- Can be used in conjunction with Accident Analysis to help get to the root cause of an accident and to assure implementation of corrective measures.
- Can be used as a method of job improvement – many safety improvement efforts lead to increased quality and/or productivity, decreased costs, and dovetails well with quality systems for continuous improvement. May eliminate wasteful and risky steps and/or materials and/or tools/machines.
- Provides for employee involvement to help assure that the best and most complete information about each job is known and documented. This allows better employee awareness of hazards and therefore the need to changes, “buy-in” on changes, and better chances that the changes will be implemented as intended. Employer responsiveness to employee input of JSAs allows employees a viable method to express concerns internally rather than to OSHA and increases their morale.
- Provides a methodical approach that can be very flexible and versatile to apply. Establishes procedures to assure successful implementation
- Documents safety intent and efforts. Provides a method to create or enhance a corporate safety memory. Methods can be paper, photo, and video.
- JSA/JHA meets regulatory requirements
- Protect employer from VSSR claims and assist legal defense on other claims

When Should JSAs/JHAs Be Created or Reviewed?

- Whenever a new job is created or discovered not to have one
- Any significant change in a job such as new methods, new materials, new facilities or new tools/equipment
- When an accident occurs
- When a “near miss” occurs – this can be a non-injury accident or one that was minor but could have been serious if not for “luck”
- Anytime an employee has new input or concerns
- Anytime other input is received such as from a vendor or consultant
- At the end of three months after a new JSA has been implemented and then annually
- ASAP if you haven’t done any yet !

Performing a Job Observation and Correcting Hazards

One of the most difficult tasks of completing a Job Safety Analysis/Job Hazard Analysis (JSA/JHA) is identifying and reporting the hazards associated with a job. Although it is impossible to predict all of the possible risks, completing a JSA can uncover a significant number of workplace hazards, the correction of which will significantly improve workplace safety. During a JSA, the supervisor has a perfect opportunity to identify, report, and correct existing hazards because the supervisor is positioned at the workstation or at the particular worksite where the task is performed. However, the task of looking for and correcting hazards is not limited to the supervisor. Workers have a significant role in making the workplace safer because they are the ones who regularly perform the task. Observing and questioning workers can reveal much about a job.

Continual Observation

Performing a planned or unplanned facility walk-through can reveal much about worker safety. Observing workers at their workstations in regard to the JSA process should be a planned process, but it does not always have to be a formal observation that uses a form to document the observation. The job safety observation (JSO) is one of the better methods to correct unsafe conditions or behavior during plant inspections or a facility walk-through. The JSO is a strong component of any safety program.

Management has an obligation to keep its eyes and ears open during every tour of the plant. If something is wrong or unsafe, it should be corrected when it is noticed. Do not wait for a formal JSA observation. Every time a manager tours the facility, they should be sure to give an employee a positive comment or to ask if there is anything they can do to improve the employee's working conditions.

There are hundreds of items that deserve a look while walking through a plant. When a supervisor goes out onto the factory floor or the job site, there are many items that he should be aware of, such as:

- Is the production proceeding on time?
- Are the parts being produced as required?
- Is the quality of the product or task meeting standards?

- Are the conditions the worker is exposed to interfering with safety or productivity?
- Can other workers or adjacent processes pose a risk to the worker?
- Has the worker that is being observed just returned from being away from work as a result of an illness or injury?
- Is the employee new to the job?

Obviously, no one can find and correct every single item. That is why supervisors should take a different direction during each walk-through and focus on the obvious hazards while inquiring about the not-so-obvious ones. The worker knows the process they are performing better than anyone else, and can be a vital resource to the supervisor. After all, who knows more about their job and surroundings than the forklift operator, punch press operator, carpenter, or laborer?

Interacting with workers during site visits is very important. Consider the following example:

A plant manager in a Midwest manufacturing plant was never successful in achieving good safety performance, cordial employee relations, fewer grievances, and increased productivity. He constantly announced his “open door policy” for any worker, but he never had a single worker take advantage of it. His talent was in the working knowledge of the machines and work processes. The plant manager would periodically be called to the shop floor to troubleshoot a defective machine or process and usually succeeded in getting the machine to run properly. He rarely made eye contact with any worker. He failed to greet workers on the way to and from the machine. Is it any wonder that workers did not trust the plant manager? Is it any wonder that there were hundreds of grievances each year on a variety of issues? How much could have been accomplished if the welfare of the worker was uppermost in the mind of the plant manager?

Supervisors usually adopt the behavior of the plant manager or owner. If the plant manager does not endorse plant safety and recognize the value of the worker, there will probably be problems with productivity and safety. If there is to be improvement in the working conditions of the worksite, then every member of management has the duty to foster improved employee relations. Much of this improvement should focus on safety conditions. Most of the visual checks during a shop tour take only a few moments and they can be very beneficial to everyone concerned. Workers are likely to have more respect for their supervisor and the company they are working for if they feel that they have a voice and that management has a concern for their safety. Casual and incidental looking during site tours on the part of the supervisor can uncover many unsafe conditions and practices. The supervisor should be able to spot unsafe conditions and unsafe worker practices because they have honed their skills to recognize these things. The key to effective incidental safety

observations is to look at what workers are doing as the supervisor goes from place to place. Every member of management should look around the department with safety on his mind. Sometimes, supervisors have to be reminded of the importance of taking safety personally and seriously. A safety director was heard to always ask supervisors, "What did you do for safety today?" At first, the supervisors thought that the safety director was paying them a slight insult, until it dawned on them that their job was to resolve safety problems and improve working conditions – not just to produce parts and meet production schedules.

Before the JSA

Supervisors are usually in the best position to conduct observations.

- They know their department.
- They know the workers.
- It is their worker that may be injured.
- It is their production that will suffer as a result of the loss.

As a result of the worker-supervisor relationship, the person that can achieve the most in the observation process is usually the worker's immediate supervisor.

Before beginning a JSA, you must choose a job to analyze and a worker to observe at that job. This choice will influence the hazards supervisors will be able to identify. There are several items to consider when the supervisor is making a determination of who will participate in the JSA and what JSA will be selected from the master list. The supervisor should collaborate with the worker on what job should be selected.

It is not always best to choose to observe workers who have been with the company the longest. Even though the worker may have plant seniority, he may not be experienced enough on a particular job to assist in completing a JSA. Some workers may have the most experience in terms of years with a particular job, but have not performed that job for a while and may not know the details of any changes to the process that may have occurred since they last performed the job.

Do not choose the worker with the least experience, because they have not been on the job long enough to help supervisors identify the basic steps of the job or to identify hazards. Indeed, they might still be learning the process themselves. It is good to question whether the worker being considered for the JSA has a history of unsafe behavior or multiple injuries. Workers with this type of history may be repeatedly injuring themselves because they are not familiar with the basic steps of the job.

During the JSA

Carefully observe the entire workstation and worker behavior while completing a JSA. Consider the presence and habitual use of the physical items, at, on, or near the job being observed. All supervisors should be skilled enough to recognize these typical workplace conditions while discussing the job and recording the JSA with the cooperation of the employee. Observation of the worker performing the task is essential to the JSA process. The movements and steps that workers take must be analyzed to ensure that they won't injure themselves or others.

To determine the hazards of the work practices of the employee, the supervisor should question if the worker can:

- be caught between two or more objects,
- be contacted by hazardous chemicals or objects that are too hot or too cold,
- be exposed to airborne hazards such as welding fumes, vapors, gasses mists, dusts, radiation, or noise,
- be injured by taking unusual postures or positions,
- be struck by a moving object,
- be caught in a hole or experience other entrapment to the body,
- make contact with hazardous energy,
- fall to a lower level,
- slip, trip, or fall on the same level,
- be caught on a moving object,
- strike against a fixed or moving object.

When observing the workstation, typical items that involve physical hazards include:

- housekeeping practices,
- the use of personal protective equipment,
- the safe storage and use of chemicals,
- lighting,
- machine guarding,
- ergonomic factors,
- noise, radiation, or any other environmental hazard,
- conditions associated with the floor, hand railing, ladders, and stairs,
- extremes of cold and heat and protective clothing,
- conditions associated with powered equipment.

Correcting Hazards

The JSA will surely uncover some physical hazards that must be corrected. Hazards that can be corrected immediately should be. Unsafe conditions that could be corrected during the JSA would include such items as: re-installing a machine guard, moving a pallet which is covering a walkway line, issuing a pair of safety glasses, replacing defective lighting, and placing wheel chocks against a trailer wheel. Other hazards may require the maintenance department or an outside

contractor be contacted to build a guard, install a handrail, conduct air sampling, improve the lighting, etc. It is very important to correct these obvious hazards as soon as possible because they could easily result in an immediate injury.

A safe workplace is management's responsibility, and it is expected that management correct all of the identified workplace hazards within a reasonable amount of time. Once discovered, every hazard should be neutralized so losses are not allowed to occur. Correcting hazards that carry a great threat should take priority over other hazards. A timetable for correcting all hazards should be created. Management has a duty to control costs, and it is less expensive to correct the hazard than to risk an injury or fatality.

If supervisors wish to convince workers that the company is serious about their efforts in the safety program, the completion and resolution of maintenance-related safety hazards must be very convincing. When a worker is willing to come forward and report an unsafe condition or a defective machine, it is management's duty to ensure that the items are corrected. On the other hand, collecting work orders along with comments from the workers and failing to correct the hazards will not help the safety program or employee relations.

Before creating any written material for a JSA (including a rough draft), the supervisor should get "a feel" for what is going on. There are times that the job will require corrections to the job or work area before the actual JSA is written. It is the astute supervisor that will stop the JSA process and tell the worker that he must have certain items corrected before the supervisor can continue. The corrections can be made in a relatively short time or maintenance will have to be summoned. The time that maintenance can complete their work on the problems may take several hours, days, or weeks. It makes no sense to take the time to complete a JSA if the worker is working near obvious hazards and they cannot be corrected. As with any workplace hazard, they should be corrected when they are discovered. Note the following example below that demonstrates the benefits involved in the delay of the JSA.

At a facility in the southeastern United States, a supervisor that was relatively new to the organization was completing his first JSA with a worker whose occupation required him to select product, place it on carts, wheel the parts to a large table, and prepare the product for shipment via UPS. It was a tough, demanding job that kept the worker busy for the entire shift. In fact, there should have been two workers at this job classification, but that was going to take place several months into the future. What was important to both the supervisor and the UPS man was to make the job safer now and not wait until another worker was added.

The supervisor studied the various steps and tasks with which the worker was involved, and settled on the selection of "Preparation and shipment of the UPS order" as his job to analyze. The supervisor, with clipboard in hand, observed the worker for several minutes to get a feel for how the job was accomplished. Since

the selected orders had to be processed as quickly as possible, the supervisor studied and listened to the worker and tried not to interrupt the process while making just a few comments on his notepad. Based on what he observed, the supervisor did not proceed to complete his JSA because he felt there were too many things wrong with the job that needed fixing right away. He informed the worker that he would delay the analysis until the immediate problems were corrected.

The worker went home at the end of the shift. The supervisor then proceeded to make some dramatic changes to the work area. He had told the worker that he first wanted to observe the job and ask questions before writing his JSA. What the supervisor noted was that the worker was working harder than necessary. During that evening, the supervisor made the following changes to the work area:

- He raised the work table six inches so the worker would not have to bend forward to do the job. This was accomplished by placing large wooden blocks under the table legs. He guessed at the proper height, but knew that the height could be adjusted if necessary.
- He placed a large spongy floor mat in front of the work table (the worker was standing on a low-profile wooden pallet at the time of the observation). The floor mat was being used at the front of an emergency exit for wiping shoe soles. The supervisor assumed that once someone goes out an emergency exit, it is not likely they would enter by the same door.
- He moved an incorrectly-placed overhead fluorescent light directly over the top and a little to the rear of the table. The light did not have fixed wiring, but was powered by an extension cord. The supervisor knew that once the light was properly placed, fixed wiring would be needed. He also cleaned the reflective shield and wiped off the bulbs to create more light.
- He then arranged the small picking containers and tape rolls and placed them on the sides of the table so the worker would not have to reach or bend forward for the parts.
- The scale for weighing the product was raised to a higher lever to make placing and removal of the parts easier.
- He placed a section of a rubber sheet on the edge of the table to make it more comfortable for the worker if he leaned against the table. The narrow sheet was held in place with duct tape and did not look “tacky.”

With a little effort, the supervisor had turned an ugly little corner of the plant into a safer area to work. His observation of the employee doing the job, along with employee comments and a review of past injuries at this work area prompted him to improve the working conditions. He was now ready to complete a formal JSA with the UPS man. Needless to say, the worker went home from the job each day less tired than in the past. In addition, the supervisor eliminated job hazards with just an hour's work and for very few dollars spent in the process.

JOB HAZARD ANALYSIS CONTROL PLAN

RESPONSIBILITY

MANAGEMENT IS REQUIRED TO PROVIDE LEADERSHIP IN ESTABLISHING AND MAINTAINING OUR POLICY IN CONDUCTING JOB HAZARD ANALYSIS WITH INVOLVEMENT OF ASSOCIATES AND THE SAFETY COMMITTEE.

HUMAN RESOURCES/SAFETY SUPERVISOR IS TO MONITOR ACTIVITIES AND RESULTS.

SELECTING JOBS FOR ANALYSIS

JOB HAZARD ANALYSIS CAN BE PERFORMED ON ALL JOBS (ROUTINE OR NON-ROUTINE).

TO DETERMINE WHICH JOBS SHOULD BE ANALYZED:

FIRST, JOBS WHERE INJURY AND/OR ILLNESS OCCURRED

JOBS WHERE SAFETY CONCERNS OR CLOSE CALLS HAVE OCCURRED.

NEW JOBS OR WHERE CHANGES HAVE BEEN MADE IN PROCESSES

JOBS DESIGNATED FOR ANALYSIS BY OUR ERGONOMICS MANAGEMENT PROGRAM AND ERGONOMIC SURVEYS

INVOLVING ASSOCIATES

ASSOCIATES ARE TO BE INVOLVED IN ALL PHASES OF ANALYSIS, FROM REVIEW TO RECOMMENDATIONS.

COMMUNICATE THE PURPOSE TO AVOID ANY ASSUMPTIONS THSAT JOB PERFORMANCE ISBEING EVALUATED

INFORM THE SAFETY COMMITTEE OF PLANNED ACTIVITIES AND RESULTS

COMMUNICATE RESULTSTO ALL ASSOCIATES BY POST RESULTS

GUIDELINES FOR CONDUCTING THE JOB HAZARD ANALYSIS

TAKE A LOOK AT THE GENERAL CONDITIONS UNDER WHICH THE JOB IS PERFORMED AND DEVELOP AND CHECKLIST

YOU MIGHT TAKE PHOTOGRAPHS OF THE WORKPLACE (IF APPROPRIATE) FOR USE IN MAKING A MORE-DETAILED ANALYSIS OF THE WORK ENVIRONMENT.

BREAKING DOWN THE JOB

BREAK DOWN JOBS INTO STEPS. LIST EACH STEP OR FOLLOW THE JOB INSTRUCTIONS SHEET OR PROCESS SHEET.

OBSERVE ASSOCIATE PERFORMING THE JOB AND RECORD ENOUGH INFORMATION TO DESCRIBE EACH JOB (BUT DO NOT MAKE IT TOO DETAILED).

WHEN COMPLETED, GO OVER THE JOB STEPS WITH THE ASSOCIATE.

IDENTIFYING HAZARDS

EXAMINE EACH STEP OF THE JOB TO DETERMINE THE HAZARDS THAT EXIST OR THAT MIGHT OCCUR.

ASK YOURSELF WHAT HAZARDOUS CONDITIONS EXIST WHICH COULD CAUSE INJURY OR ARE POTENTIALLY DANGEROUS TO THE ASSOCIATE OR CAUSE INJURY TO OTHERS.

EVALUATING HAZARDS

LOOK INTO WHAT WOULD CAUSE THESE HAZARDS

ESTABLISH WHAT EVENTS COULD LEAD TO AN INJURY OR ILLNESS FOR EACH HAZARD IDENTIFIED.

RECOMMENDATIONS SHOULD BE BASED ON THE RELIABILITY OF THE SOLUTION. GENERALLY, THE MOST RELIABLE PROTECTION IS TO ELIMINATE THE SOURCE OR CAUSE OF THE HAZARD. COMPARE FINDINGS WITH SIMILAR JOBS IN THE OPERATION TO INCREASE EFFECTIVENESS OF REDUCING HAZARDS.

CONSIDER REDESIGNING EQUIPMENT, INSTALLING SOME NEW COMPONENTS, CHANGING TOOLS, JOB ROTATION, INSTALLING VENTILATION, ADDING MACHINE GUARDS, ETC.

IF HAZARDS CANNOT BE ELIMINATED, THE DANGER SHOULD BE REDUCED AS MUCH AS POSSIBLE.

IMPROVING THE PROCEDURE OR USING PERSONAL PROTECTIVE EQUIPMENT IS SOME OF THE PRIMARY WAY TO REDUCE THE DANGER.

CHANGES SHOULD BE ACCOMPANIED BY TRAINING PROGRAMS THAT ARE AIMED AT COVERING THE WORK PROCEDURES AND EQUIPMENT IN DETAIL.

RECOMMENDING SAFE PROCEDURES AND PROTECTION

REVIEW IDENTIFIED HAZARDS OR POTENTIAL HAZARDS WITH THE ASSOCIATE PERFORMING THE JOB AND DETERMINE WHETHER THE JOB COULD BE PERFORMED IN ANOTHER WAY.

CONSIDER CHANGING THE JOB SEQUENCE, USE OF SAFETY EQUIPMENT, TRAINING OR JOB ROTATION, OR MODIFICATION OF EQUIPMENT.

IF SAFER AND BETTER JOB STEPS CAN BE USED, LIST EACH STEP AND DESCRIBE THE NEW METHOD.

LIST EXACTLY WHAT THE ASSOCIATE NEEDS TO KNOW TO PERFORM THE JOB USING THE NEW METHOD.

DO NOT MAKE GENERAL STATEMENTS ABOUT THE PROCEDURE, SUCH AS "BE CAREFUL." BE VERY SPECIFIC IN YOUR RECOMMENDATION.

ONCE IT IS ESTABLISHED WHAT THE NEW PROCEDURE WILL BE, REVISE PERTINENT JOB INSTRUCTION/PROCESS DOCUMENTATION TO ENSURE THAT THIS AND FUTURE CHANGES ARE PART OF A CONTROLLED DOCUMENTATION.

JOB HAZARD ANALYSIS REVIEW

REVIEW AND UPDATE JOB HAZARD ANALYSIS PERIODICALLY. IF AN ACCIDENT OR INJURY OCCURS ON A SPECIFIC JOB, THE JOB HAZARD ANALYSIS SHOULD BE REVIEWED TO DETERMINE WHETHER CHANGES ARE NEEDED IN THE JOB PROCEDURE.

ANY TIME THE JOB HAZARD ANALYSIS IS REVISED, TRAINING IN THE JOB METHODS OR PROTECTIVE MEASURES MUST BE PROVIDED TO ALL ASSOCIATES AFFECTED.

EMPLOYEE RIGHTS

ASSOCIATES HAVE A RIGHT TO FILE A COMPLAINT WITH OSHA OR ANOTHER GOVERNMENT AGENCY ABOUT WORKPLACE SAFETY.

ASSOCIATES CANNOT BE PUNISHED FOR REFUSING A WORK ASSIGNMENT IF THEY HAVE A REASONABLE BELIEF THAT IT WOULD PUT THEM IN REAL DANGER OF DEATH OR SERIOUS PHYSICAL INJURY. PROVIDED, THAT IF POSSIBLE, THEY HAVE REQUESTED THEM TO REMOVE THE DANGER AND IT WAS REFUSED; AND PROVIDED THAT THE DANGER CANNOT BE ELIMINATED QUICKLY ENOUGH THROUGH NORMAL OSHA ENFORCEMENT PROCEDURES.

JOB HAZARD ANALYSIS FORM

THE FORM ON THE FOLLOWING PAGE IS A SAMPLE OF WHAT COULD BE USED FOR JOB HAZARD ANALYSIS.

HUMAN RESOURCES MANAGER/SAFETY SUPERVISOR WILL REQUEST AND COORDINATE ACTIVITIES RELATED TO JOB HAZARD ANALYSIS BASED ON INJURIES OR "CLOSE CALLS" OR AS PART OF THE SAFETY PROGRAM.

DEPARTMENT MANAGERS AND SUPERVISORS WILL INITIATE JOB HAZARD ANALYSIS OF NEW JOBS AND/OR JOBS WHERE CHANGES HAVE BEEN MADE IN PROCESSES AND PROCEDURES.

COMPLETED FORMS ARE TO BE GIVEN TO THE HUMAN RESOURCES MANAGER FOR FILING AND POSTING.

Job Safety Analysis Review Checklist

Conduct this review annually to ensure correct job safety analysis (JSA) conduct and usage.

JSA PERFORMANCE AREA	Yes	No	N/A
Is the individual or JSA team performing JSAs on an on-going basis for selected jobs?			
Are employees participating in the JSA review or development process?			
Have any new JSAs been completed this year?			
How many JSAs were completed this year?			
Is a formal JSA review sheet being used?			
Are JSAs selected for review on a priority basis?			
Are JSAs which are reviewed then properly modified and retyped?			
Are all JSAs correct as to the format in all three columns?			
How many JSAs are fully completed?			
How many JSAs are in the completion stage?			
Are all JSAs gathered in a binder or book?			
Are JSAs neatly posted at key work stations?			
Are posted JSAs the most current copies?			
Is the JSA master list complete & up-to-date?			
Are JSAs complete, properly displayed, clean (not soiled) and where posted, is the JHA appearance good (not bent, curled, soiled, etc.)?			
Can records be produced to show that completed JSAs were reviewed by employees, supervisors, and the JSA team?			
Is JSA information incorporated into efforts to improve training, workspace design, etc.			

Investigation Guide

The following guide helps identify the root causes when they are conditions or actions. By answering the questions, you can get to the “root” of things when an accident occurs.

If the cause appears to be ...

A CONDITION	AN ACTION
Why did it exist? Why had no one noticed and corrected it?	Why was it being done? Why was it being done this way? Why was it (job or detail) necessary?
What caused it to exist? What caused it to be involved?	What was its purpose? What other way could it be done? What details could be eliminated? What instructions were not followed?
Where was it? Where was its source? Where else does it exist? Where can I find out?	Where should it be done? Where else is it being done?
When did it occur? When do similar conditions occur?	When should it be done?
Who was responsible for it? Who can give me answers? Who should take corrective action?	Who is best qualified to do it? Who can give me answers? Who can show me what was being done?
How should it be corrected? How can it be avoided in the future?	How is the best way to do it? How can it (job or detail) be improved?

JOB SAFETY ANALYSIS FORM

Job to be Analyzed: _____ Date: _____

Location of the Job: _____ People Responsible: _____

1. Basic job steps	2. Hazards and potential hazards	3. Hazard controls and safe work methods

**Job Hazard Analysis—Approved Copy
JHA Form 3**

JHA NUMBER: 54 TITLE OF JOB: Placing pallet loads on racking or in storage. DATE JHA WAS COMPLETED: 2/15/01
 PERSON COMPLETING JHA: Sam Spitalo PERSON(S) ASSISTING IN JHA: C. Hazel
 LOCATION / FACILITY: East-Side Warehouse DATE JHA WAS RECEIVED: 1/28/01
 RECOMMENDED PPE: Hard hat; steel toe shoes; gloves; safety glasses.

Basic Job Steps	Hazards Present In Each Job Step	Correct and Safe Procedures For Completing the Job
1. Inspect pallet loads.	1. <u>SB</u> – forklifts in the area <u>CW</u> – splinters from pallets	1. Inspect all pallet loads before lifting them. Check to ensure that shrink-wrapping is in place. Look at the condition of the pallet to ensure there aren't any defective boards. If defective boards are present, replace the pallet. Be alert for passing forklifts; keep clear of their movement. Wear gloves to prevent splinters.
2. Lift the load.	2. <u>SA</u> – load against other objects	2. Ensure that forks are wide enough and pull forward with the forks and enter the pallet. Look at the work area to keep from striking anything when the pallet is lifted. Keep the load as close to the floor as possible. If the load is too high to see over, operate in reverse.
3. Drive to the designated area.	3. <u>SB</u> – workers or objects struck by forklift <u>SA</u> – load against other objects	3. Drive the load to the spot where it will be deposited. Be alert for other workers, forklifts and objects in your path of travel. Sound your horn where necessary to alert others and follow safe driving rules.
4. Position the forklift and lift the load.	4. <u>SA</u> – load against other objects	4. Pull forward into the area where the load will be placed on the racking. Be aware of everyone around you and keep from striking objects with the load or forklift.
5. Place the load on the racking.	5. <u>SB</u> – falling objects <u>SA</u> – load against other objects	5. When you are sure you are in the correct alignment for the racking, lift the load and place it on the racking. Keep back far enough from the racking to keep from striking it. Do not allow anyone to walk under the load. Pull forward cautiously and place the pallet on the racking. Be sure the front and rear of the pallet are secure. Tilt forward and lower the forks. Be aware of sprinkler heads or natural gas pipes.
6. Lower the forks and pull away.	6. <u>SA</u> – forks or forklifts against objects <u>SB</u> – workers or objects struck by forklift	6. Look to the sides and behind you before backing up. Be sure the forks are clear of the racking area before lowering. Safely drive to next task.

Hazard Selection for the middle column: SB = Struck By; CW = Contact With; CBy = Contacted By; CB = Caught Between; SA = Struck Against; CI = Caught In; CO = Caught On; O = Overexertion or Repetitive Motion; FS = Fall At the Same Level; FB = Fall to Below; E = Exposure to Chemicals, Noise, etc.

Typical Errors on JSA Forms

JSA NUMBER: Omitted or Incorrect TITLE OF JOB: Omitted or Incorrect DATE JSA COMPLETED: Omitted

PERSON COMPLETING JSA: Omitted or Incorrect PERSON(S) ASSISTING IN JSA: Omitted

LOCATION / FACILITY: Omitted or Incorrect DATE JSA WAS RECEIVED: : Omitted

RECOMMENDED PPE: Omitted, Incorrect, Does Not Match Descriptions Below

Basic Job Steps

- Too many words are used in this section. Action words (verb) are critical.
- Words used do not describe the basic job step.
- Basic job steps go beyond identifying just the “what” in the JSA.
- No agreement was reached before starting on what the goals are for JSA so that conflicts about the number of steps can be avoided or resolved.
- Too many steps are listed. JSAs should be on one page (front and back if needed). Sub-routines can be used if needed.

Hazards Present in Each Job Step

- Hazards are not identified by code (SB, CI, etc.)
- Real hazards are not recognized and recorded.
- Hazards are over-stated; in some cases the hazards do not exist.
- Hazards are not recorded if no solution or corrections are readily available.
- Hazards listed do not specify how a person can be injured.

Correct and Safe Procedures for Completing the Job

- The safe procedure does not identify the information in the basic step and/or does not identify the hazards.
- Solutions to preventing the hazards are not provided.
- Alignment of numbered sections/steps are not in a single horizontal row.
- Narrative is difficult to understand.
- Specific PPE required has been omitted from the explanation in a step.
- Too little narrative, the job step and job hazards are not identified.
- Too much narrative, overwriting, paragraphs are too long.

OSHA COMPLIANCE MANUAL

Sample job hazard analysis

Cleaning inside surface of chemical tank—Top manhole entry

STEP	HAZARD	NEW PROCEDURE OR PROTECTION
1. Select and train operators.	Operator with respiratory or heart problem; other physical limitation. Untrained operator—failure to perform task.	<ul style="list-style-type: none"> Examination by industrial physician for suitability to work. Train operators. Dry run. [Reference: National Institute for Occupational Safety and Health (NIOSH) Doc. #80-406]
2. Determine what is in the tank, what process is going on in the tank, and what hazards this can pose.	Explosive gas. Improper oxygen level. Chemical exposure— Gas, dust, vapor: irritant toxic Liquid: irritant toxic corrosive Solid: irritant corrosive	<ul style="list-style-type: none"> Obtain work permit signed by safety, maintenance and supervisors. Test air by qualified person. Ventilate to 19.5%-23.5% oxygen and less than 10% LEL of any flammable gas. Steaming inside of tank, flushing and draining, then ventilating, as previously described, may be required. Provide appropriate respiratory equipment—SCBA or air line respirator. Provide protective clothing for head, eyes, body and feet. Provide parachute harness and lifeline [Reference: OSHA standards 1910.106, 1926.100, 1926.21(b)(6); NIOSH Doc. #80-406] Tanks should be cleaned from outside, if possible.
3. Set up equipment.	Hoses, cord, equipment—tripping hazards. Electrical—voltage too high, exposed conductors. Motors not locked out and tagged.	<ul style="list-style-type: none"> Arrange hoses, cords, lines and equipment in orderly fashion, with room to maneuver safely. Use ground fault circuit interrupter. Lockout and tag mixing motor, if present.
4. Install ladder in tank.	Ladder slipping	<ul style="list-style-type: none"> Secure to manhole top or rigid structure.
5. Prepare to enter tank.	Gas or liquid in tank.	<ul style="list-style-type: none"> Empty tank through existing piping. Review emergency procedures. Open tank. Check of job site by industrial hygienist or safety professional. Install blanks in flanges in piping to tank. (Isolate tank.) Test atmosphere in tank by qualified person (long probe).
6. Place equipment at tank-entry position.	Trip or fall.	<ul style="list-style-type: none"> Use mechanical-handling equipment. Provide guardrails around work positions at tank top.
7. Enter tank.	Ladder—tripping hazard. Exposure to hazardous atmosphere.	<ul style="list-style-type: none"> Provide personal protective equipment for conditions found. [Reference: NIOSH Doc. #80-406; OSHA CFR 1910.134] Provide outside helper to watch, instruct and guide operator entering tank, with capability to lift operator from tank in emergency.
8. Cleaning tank.	Reaction of chemicals, causing mist or expulsion of air contaminant.	<ul style="list-style-type: none"> Provide protective clothing and equipment for all operators and helpers. Provide lighting for tank (Class I, Div. 1). Provide exhaust ventilation. Provide air supply to interior of tank. Frequent monitoring of air in tank. Replace operator or provide rest periods. Provide means of communication to get help if needed. Provide two-man standby for any emergency.
9. Cleaning up.	Handling of equipment, causing injury.	<ul style="list-style-type: none"> Dry run. Use material-handling equipment.

Instructions for Downloading Materials from BWC's Learning Center

1. Go to: www.bwclearningcenter.com
2. Log in using your username and password
 - a. If you have forgotten your username and password call 1-800-OHIOBWC
3. Click the "Team Center" building
4. Click "Team Rooms"
5. Type "JSA" in the keyword field and click search
6. Click the "Job Safety Analysis" team room which should be the first team room listed
7. Click "Content" listed under the *Team Room Tools*
8. Click on the document that you wish to download
 - a. Students and instructors are also able to submit resources that might be useful to other team members
9. Log off when finished

A one-hour presentation is available to be downloaded in the team room. More content will be added as it is developed.

Resources

Additional Resources for Job Safety Analysis

All of these materials are available through the BWC Division of Safety & Hygiene Libraries. Call 800-644-6292 or e-mail library@bwc.state.oh.us.

Books

- *Job Hazard Analysis*, OSHA 3071. Occupational Safety and Health Administration, 2002, <http://www.osha.gov/Publications/osha3071.pdf>.
- *Job Safety Analysis Made Simple*. Canadian Centre for Occupational Health and Safety and Human Resources Development Canada, Labour Program, 2002.
- *Job Hazard Analysis Manual*. Oregon State University. <http://oregonstate.edu/ehs/oshabrd/hazardanalysis.pdf>
- Swartz, George. *Job Hazard Analysis: a guide to identifying risks in the workplace*. Government Institutes, 2001.
- *Workplace Safety In Action: Job Safety Analysis*. J. J. Keller & Associates, 2002.

Recent Articles

- Geronsin, Rolin. "Job hazard assessment: a comprehensive approach." *Professional Safety*, December 2001, 23-30.
- Roughton, James E. and Cliff Florczak. "Make JSAs Work for You." *Safety & Health*, January 1999, 72-75.
- Swartz, George. "Job hazard analysis: a primer on identifying and controlling hazards." *Professional Safety*, November 2002, 27-33.

Web Sites

- *Job Safety Analysis*. University of California, Berkeley, Office of Environment, Health and Safety. <http://www.ehs.berkeley.edu/jsa.html>.
- *Job Safety Analysis*, PowerPoint presentation from Bechtel Telecommunications, Environmental Safety and Health. http://www.bechteltelecoms.com/docs/safety_training_support/JSATrainingPresentation.ppt.
- *Job Safety Analysis*. PowerPoint presentation from Quanta Services. Safety Information Resources on the Internet. <http://siri.uvm.edu/ppt/jha/jha.ppt>.
- *Job Hazard Analysis/PPE*. Seton Compliance Resource Center. <http://www.setonresourcecenter.com/safety/jha>.
- *Job Safety Analysis Worksheets*, Florida Dept. of Environmental Protection. <http://www.dep.state.fl.us/admin/safety/JSA.htm>.
- *What is a Job Hazard Analysis?* OSH Answers, Canadian Centre for Occupational Health and Safety. <http://www.ccohs.ca/oshanswers/hsprograms/job-haz.html>

Videos

- *Ergonomics: Job Safety Analysis*, 1996, 16 minutes, No. 640030
- *Job Safety Analysis*, 1997, 21 minutes, No. 660077
- *Job Safety Analysis*, Date unknown, 15 minutes, No. 660049
- *Job Safety Analysis*, 1996, 17 minutes, No. 660044

JOB SAFETY ANALYSIS PLANNING SHEET

Department:

Date:

Section:

Position:

Directions: Record your priorities for JSA on this form. In determining which task to analyze first, consider which tasks are most hazardous by looking at the frequency of incidents, rate of disabling injuries, and severity potential. Also look closely at all new tasks and revised tasks where the potential for injury or damage is unknown.

This JSA Planning Sheet must be kept up-to-date and revised as the scope of tasks changes and new information is obtained. Tasks on this list must be routinely reviewed.

Task	Hazards	Date Written	Date Revised
1.			
2.			
3.			
4.			
5.			

BREAK THE TASK INTO STEPS

1. Write down everything the employee does.

2. Number each step as you write it down.

3. Use action verbs.

4. Watch for a change of activity, direction, or movement.

5. Describe each step completely, but concisely.

6. Use approximately 10-15 sequential steps.

7. Reach consensus with the employee.

HAZARD IDENTIFICATION CHECKLIST

Equipment

- | | |
|-------------------------------------|---|
| <input type="checkbox"/> Fire | <input type="checkbox"/> Electrical |
| <input type="checkbox"/> Mechanical | <input type="checkbox"/> Hydraulic |
| <input type="checkbox"/> Pneumatic | <input type="checkbox"/> Machine guarding |

Environment—Chemical

- | | |
|-------------------------------------|-------------------------------------|
| <input type="checkbox"/> Inhalation | <input type="checkbox"/> Absorption |
| <input type="checkbox"/> Ingestion | <input type="checkbox"/> Injection |

Environment—Physical

- | | |
|--|--|
| <input type="checkbox"/> Slip, trip, or fall | <input type="checkbox"/> Struck by or struck against |
| <input type="checkbox"/> Caught in, on, or between | <input type="checkbox"/> Noise |
| <input type="checkbox"/> Overexertion (while lifting, pulling, pushing, bending) | <input type="checkbox"/> Contact with extreme heat, extreme cold, electrical current |
| <input type="checkbox"/> Vibration | <input type="checkbox"/> Material handling |

Environment—Ergonomic

- | | |
|---|---|
| <input type="checkbox"/> Inappropriate work environment | <input type="checkbox"/> Inappropriate tools |
| <input type="checkbox"/> Poor lighting | <input type="checkbox"/> Repeated motion in awkward positions |
| <input type="checkbox"/> Poor tool design | <input type="checkbox"/> Poor workstation layout |

Environment—Biological

- | | |
|--|---|
| <input type="checkbox"/> Contact with bacteria | <input type="checkbox"/> Contact with viruses |
| <input type="checkbox"/> Contact with fungi | <input type="checkbox"/> Contact with parasites |
| <input type="checkbox"/> Contaminated water | |

Work Practices—Employee Behavior

- | | |
|--|--|
| <input type="checkbox"/> Employee wearing PPE? | <input type="checkbox"/> Lockout/tagout procedures followed? |
|--|--|

Other

- | | |
|--------------------------|--------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> |

METHODS OF CONTROL

Whenever you can, your goal is to eliminate the hazard altogether. However, it will not always be possible to do this. When you can't eliminate the hazard, your next step is to control it. There are three general categories of hazard control.

Engineering

- Redesign of equipment
- Substitution of a material, equipment, or process
- Change of a process to minimize the hazard
- Use of barriers or shields to isolate a hazard
- Use of barriers or safeguards to isolate a person
- Ventilation

Administrative

- Training and education
- Procedures to limit exposure
- Increasing distance between source and receiver
- Adjusting work schedules and rotating assignments to reduce exposure
- Maintenance
- Good housekeeping
- Wet-work methods
- Contracting specialized services
- Lockout/tagout

Personal protective equipment

- Protective clothing
- Eye and face protection
- Respiratory protection
- Hearing protection
- Headwear
- Footwear
- Fall protection
- Protection against electrical hazards

QUESTIONS TO ASK WHEN DETERMINING CONTROLS

When you are analyzing a task to determine which controls to recommend, here are some questions you can use as a guide.

1. Can you eliminate the hazard?
2. Can an engineering change make the task or work area safer?
3. Are there tools or equipment that could make the task safer?
4. Can the company install machine safeguards?
5. Can the ventilation system be improved?
6. Can a different, less hazardous, material be used?
7. Is there a less hazardous way to do the job?
8. Can you reduce the frequency of exposure?
9. Can you rotate assignments to reduce exposure?
10. Can employees use personal protective equipment?

INSTRUCTIONS FOR COMPLETING THE JOB SAFETY ANALYSIS FORM

Job Safety Analysis (JSA) is an important analyzing tool that works by finding hazards and eliminating or minimizing them before the job is performed, and before they have a chance to become injuries or damage. Use JSA for job clarification and hazard awareness, as a guide in new employee training, for periodic contacts and for retraining of senior employees, as a refresher on jobs that run infrequently, and for informing employees of specific job hazards and protective measures. It can also be used as an incident investigation tool.

Set priorities for doing JSAs: jobs that have a history of causing injury or damage, jobs that have produced disabling injuries, jobs with high potential for disabling injury or death, and new jobs.

Select a job to be analyzed. Before filling out this form, consider the following. The purpose of the job - What has to be done? Who has to do it? The activities involved - How is it done? When is it done? Where is it done?

In summary, to complete this form you should consider the purpose of the job, the activities it involves, and the hazards it presents. If you are not familiar with a particular job or operation, interview an employee who is. In addition, observing an employee performing the job, or "walking through" the operation step by step may give additional insight into potential hazards. You may also wish to videotape the job and analyze it.

Here's how to do each of the three parts of a Job Safety Analysis:

SEQUENCE OF BASIC JOB STEPS

Examining a specific job by breaking it down into a series of steps or tasks, will enable you to discover potential hazards employees may encounter.

Each job or operation will consist of a set of steps or tasks. For example, the job might be to move a box from a conveyor in the receiving area to a shelf in the storage area. To determine where a step begins or ends, look for a change of activity, change in direction or movement.

Picking up the box from the conveyor and placing it on a handtruck is one step. The next step might be to push the loaded handtruck to the storage area (a change in activity). Moving the boxes from the truck and placing them on the shelf is another step. The final step might be returning the handtruck to the receiving area.

Be sure to list *all* the steps needed to perform the job. Some steps may not be performed each time; an example could be checking the casters on the handtruck. However, if that step is generally part of the job it should be listed.

POTENTIAL HAZARDS

A hazard is a potential danger. The purpose of the Job Safety Analysis is to identify ALL hazards - both those produced by the environment or conditions and those connected with the job procedure.

To identify hazards, ask yourself these questions about each step:

Is there a danger of the employee striking against, being struck by, or otherwise making injurious contact with an object?

Can the employee be caught in, by, or between objects?

Is there potential for slipping, tripping, or falling?

Could the employee suffer strains from pushing, pulling, lifting, bending, or twisting?

Is the environment hazardous to safety and/or health (toxic gas, vapor, mist, fumes, dust, heat, or radiation)?

Close observation and knowledge of the job is important. Examine each step carefully to find and identify hazards - the actions, conditions, and possibilities that could lead to injury, illness, or damage. Compiling an accurate and complete list of potential hazards will allow you to develop the recommended safe job procedures needed.

RECOMMENDED ACTION OR PROCEDURE

Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the hazards that could lead to an injury, illness, or damage.

Begin by trying to: (1) engineer the hazard out; (2) provide guards, safety devices, etc.; (3) provide personal protective equipment; (4) provide job instruction training; (5) maintain good housekeeping; (6) insure good ergonomics (positioning the person in relation to the machine or other elements in such a way as to improve safety).

List the recommended safe operating procedures. Begin with an action word. Say exactly what needs to be done to correct the hazard, such as, "lift using your leg muscles." Avoid general statements such as, "be careful."

List the required or recommended PPE necessary to perform each step of the job.

Give a recommended action or procedure for each hazard.

Serious hazards should be corrected immediately. The JSA should then be changed to reflect the new conditions.

Finally, review your input on all three columns for accuracy and completeness. Determine if the recommended actions or procedures have been put in place. Re-evaluate the JSA as necessary.

Safety Performance

“All of our core values are vital yet, none are more important than working safely and with integrity.”

— Jack Davis APS President and Chief Executive Officer —

Safety is the overriding value of all aspects of our business. The first job of all employees at APS is to ensure their safety, that of their co-workers and the public at large. While the growth of our service territory dictates greater efficiency and productivity, these added demands cannot come at the expense of the health and safety of our employees.

With the amount of work necessary to meet our rapidly growing service territory, the challenge to work safely will continue into the future. This challenge is increasingly significant as many experienced employees reach retirement age and new members of our team are trained. In the APS 2005-2010 Business Plan, the management team asks each employee to “Own the Challenge.” Until APS employees can achieve zero recordable injuries and sustain that performance, there will always be room for improvement.

Specifically, employees have been asked to focus on six fundamental principles of safety:

- Use the right tool for the job
- Get the necessary training
- Wear appropriate personal protective equipment
- Conduct thorough tailboard (pre-job) briefings
- Stop work if there is a safety concern or question
- Report all close calls

Leading Safety Performance

The sustained safety performance of APS employees has resulted in our company being in the top five performers in the past five years (twice listed as number one) as compared to like-sized investor-owned utilities by the Edison Electric Institute. Our management team is responsible and accountable for safety performance. However, leadership recognizes that the expertise in safe work practice design, application and performance resides with frontline employees and their immediate supervision. APS' success in safety is the result of the efforts of labor and management teams. These teams are supported by full-time safety and health professionals working cooperatively, in the various divisions and at each power plant. We believe this approach works best at APS and will continue to drive personal behaviors and safe work practices. The following describes three of the many teams approaches used to drive the safety program at APS:

Safety and Health Advisory Team

The Safety and Health Advisory Team is responsible for providing cross-functional strategic direction and leadership on companywide health and safety issues. The team consists of safety and health professionals and management from each business unit of the company. Each team member represents his or her respective business unit and communicates health and safety issues between the team and the facilities. The team makes recommendations to the EHS vice president on all matters requiring executive oversight.

The Safety and Health Advisory Team is supported by two different issue teams, a Prevention Team and a Compliance Team. The Prevention Team advances programs and practices that promote employee wellness and accident prevention. The Compliance Team addresses regulatory compliance matters and interpretation of best management practices.

Joint Health and Safety Committee

The Accident Prevention Manual (APM) Rules/Revision Committee is comprised of a group of company and Local IBEW employees who meet to review the safety rules and any employee requests for revisions to the manual. The committee, which is indicative of the partnership shared between the

company and IBEW, in addition to fielding these requests will take individual sections of the manual and review them to determine if updating is necessary. Once a review is completed and change is deemed necessary, the manual is updated and brought to the committee for final discussion and signature. After the committee has signed off on the rule, it goes to the Safety and Health Advisory Team and the IBEW Executive Board for review, acceptance and implementation.

Craft Observation Teams

The Energy Delivery business unit at APS has established four full-time IBEW positions that conduct field observations of membership work practices and work conditions. These employees conduct on-site interventions to improve work practices and environments on a real-time basis. They are not required to report specifics of the observations to local supervision or management. They simply provide a summary of observations on a periodic basis. This technique enhances trust among union membership and creates an environment that is open to immediate corrective or improvement actions.

This same approach is used at several APS Generation facilities during critical overhauls and outages. Just as with the Energy Delivery personnel, generation employees welcome the intervention by peers and collaborate to achieve improved practices and conditions.

Critical Success / Performance Indicators

We recognize the need to track and report safety performance in the form of numbers of injured employees. However, we never lose sight of the fact that these statistics are not just numbers; they are our fellow employees, peers and friends. Their injuries may have been the result of a management system failure, or an individual performance error and may have been non-preventable. Regardless of the cause of the accident, we must learn from the incident in order to prevent similar injuries in the future.

As a corporation, we report on safety statistics in order to measure and improve our performance. In its 2005 - 2010 business Plan, "Owning the Challenge," APS has challenged its entire staff to be "the best of the best" as judged against liked-sized investor-owned utilities. APS' goal is to be ranked number one among its peer utilities by 2010 as measured by:

- All Injury Incident Rate - total OSHA Recordable injuries reported;
- Lost Work Incident Rate - total number of OSHA Recordable injuries resulting in lost workdays; and,
- Severity Incident Rate - total number of workdays lost due to OSHA Recordable injuries.

In 2005, after several years of very high safety performance, our overall safety performance declined. Our total recordable injuries, All Injury Incident Rate (AIIR) and Lost Work Incident Rate (LWIR) increased from 2004. The overall severity of the injuries in 2005 was somewhat less than 2004, as evidenced by a decrease in the Severity Incident Rate (SIR).

While our performance decreased in 2005, and we are taking steps to improve that performance in 2006, our safety injury rates continue to be well below the historical electric utility averages, as shown in the chart below. (Note: We anticipate the 2005 Edison Electric Institute utility industry safety statistics will be available in July 2006. We will update this chart when those statistics are available.)

Safety Performance

	2005	2004	2003	2002	2001
Total Recordable Cases					
APS Total	149	98	130	117	117
Target Maximum	0	0	0	0	0
APS Injury Incident Rate (AIIR) ^(a)	2.23	1.52	2.04	1.81	1.83
Target Maximum	0	0	0	0	0
Electric & Gas Utility Industry Average^(b)	N/A	3.7	3.12	3.33	3.63
Lost Work Day Cases					
APS Total	44	31	16	15	20
Target Maximum	0	0	0	0	0
APS Injury Incident Rate (LWIR) ^(a)	0.66	0.49	0.25	0.23	0.31
Target Maximum	0	0	0	0	0
Electric & Gas Utility Industry Average^(b)	N/A	0.70	0.61	0.8	0.086
Lost Work Days					
APS Total	1060	1149	691	313	425
Target Maximum	0	0	0	0	0
APS Injury Incident Rate (SIR) ^(a)	15.87	17.81	10.83	4.81	6.66
Target Maximum	0	0	0	0	0
Electric & Gas Utility Industry Average^(b)	N/A	35.7	18.48	22.17	23.96
APS Fatalities	0	0	0	1	0

(a) All Injury Incident Rate (AIIR) : The total of all recordable cases multiplied by 200,000 and divided by the actual employee exposure hours worked. Lost Work Day Incident Rate (LWIR) : The total of all recordable cases multiplied by 200,000 and divided by the actual employee exposure hours worked. Severity Incident Rate (SIR) : The total of all recordable cases multiplied by 200,000 and divided by the actual employee exposure hours worked.

(b) Source: Edison Electric Institute Safety Survey 2000, 2001, 2002 and 2003.

Accidents occur for a variety of reasons, preventable and non-preventable. For a number of years, we have used an internal indicator to help assess safety performance, which we call "Preventable Recordable Accidents." This was used to help employees focus on preventing accidents in the workplace, and to provide incentives for successful performance in reducing accidents in which management and/or the employee have control over the events leading to an accident. We think that this indicator was useful in helping APS establish its industry leading safety record. However, we also believe that the use of this indicator has achieved its purpose, and we will transition in 2006 to the use of industry standard safety statistics (e.g. OSHA Total Recordable) for both external reporting and internal performance indicators and incentives.

Preventable OSHA Recordable Injury History

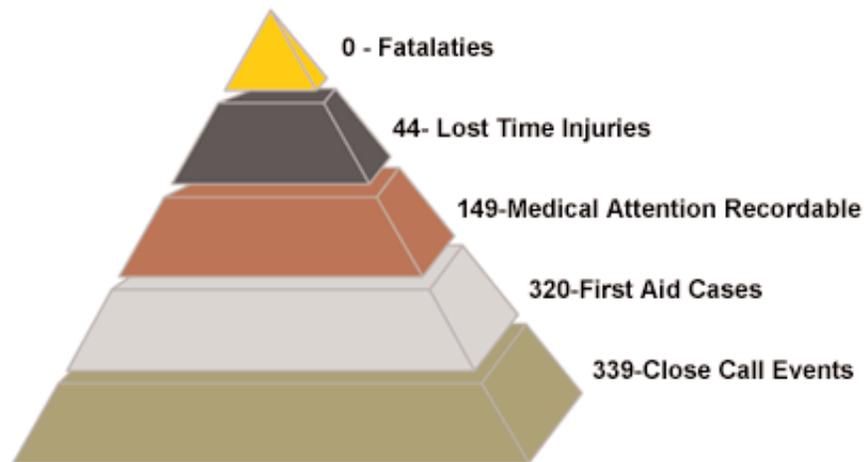
	2005	2004	2003	2002	2001
Fatalities	0	0	0	1	0
Loss Time Injuries	25	22	15	10	16
Medical Attention Recordable Injuries	66	48	73	84	84
Total	91	70	88	95	100

The PNW/APS Safety Pyramid shown below helps us visualize the relationship of safety events, as we continue to move our safety efforts to the very front of the accident evaluation process in order to prevent future accidents. We have a formal electronic Event Notification and Tracking System, and strongly encourage reporting of all close-call events so that we can evaluate the circumstances behind the close-call in order to further improve our safety program, whether that be by changing procedures, improved training, equipment changes, etc. By evaluating close calls and making corrections when appropriate, we believe we can identify potential problem areas before they result in an accident. Our close call event numbers have increased over the past several years as we have been successful in improving employee cooperation in this important part of our overall safety effort.

First Aid & Close Call Events History

	2005	2004	2003	2002	2001
First Aid Cases	320	218	223	235	205
Close Call Events	339	288	236	205	267
Total	659	506	459	440	472

2005 PNW/APS Safety Pyramid



Despite our performance in 2005, the fact remains that when compared to the rest of industry, APS is a leader; a benchmark utility with an exceptional safety performance record. We are confident that we will reverse our downward performance of 2005 as we work toward meeting our 2010 goal of being the top utility in our sector for safety performance.

Job Hazard Analysis



U.S. Department of Labor
Elaine L. Chao, Secretary

Occupational Safety and Health Administration
John L. Henshaw, Assistant Secretary

OSHA 3071
2002 (Revised)

Contents

Who needs to read this booklet?	1
What is a hazard?	1
What is a job hazard analysis?	1
Why is job hazard analysis important?	2
What is the value of a job hazard analysis?	2
What jobs are appropriate for a job hazard analysis?	3
Where do I begin?	4
How do I identify workplace hazards?	6
How do I correct or prevent any hazards?	12
What else do I need to know before starting a job hazard analysis?	12
Why should I review my job hazard analysis?	13
When is it appropriate to hire a professional to conduct a job hazard analysis?	14
OSHA Assistance, Services, and Programs	15
How can OSHA help me?	15
How does safety and health program management assistance help employers and employees?	15
What are state plans?	16
How can consultation assistance help employers?	16
Who can get consultation assistance and what does it cost?	17
Can OSHA assure privacy to an employer who asks for consultation assistance?	17

Can an employer be cited for violations after receiving consultation assistance?	18
Does OSHA provide any incentives for seeking consultation assistance?	18
What are the Voluntary Protection Programs?	18
How does VPP work?	19
How does VPP help employers and employees?	19
How does OSHA monitor VPP sites?	20
Can OSHA inspect an employer who is participating in the VPP?	20
How can a partnership with OSHA improve worker safety and health?	21
What is OSHA's Strategic Partnership Program (OSPP)?	21
What do OSPPs do?	21
What are the different kinds of OSPPs?	22
What are the benefits of participation in the OSPP?	22
Does OSHA have occupational safety and health training for employers and employees?	23
Does OSHA give money to organizations for training and education?	24
Does OSHA have other assistance materials available?	25
What other publications does OSHA offer?	25
What do I do in case of an emergency or if I need to file a complaint?	26

OSHA Regional and Area Office Directory	27
OSHA-Approved Safety and Health Plans	32
OSHA Consultation Projects	36
Appendix 1 — Hazard Control Measures	41
Appendix 2 — Common Hazards and Hazard Descriptions	43
Appendix 3 — Sample Job Hazard Analysis Form	46

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: <ol style="list-style-type: none">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: <ol style="list-style-type: none"> 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: <ol style="list-style-type: none"> 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.**

How do I correct or prevent hazards?

After reviewing your list of hazards with the employee, consider what control methods will eliminate or reduce them. For more information on hazard control measures, see Appendix 1. The most effective controls are engineering controls that physically change a machine or work environment to prevent employee exposure to the hazard. The more reliable or less likely a hazard control can be circumvented, the better. If this is not feasible, administrative controls may be appropriate. This may involve changing how employees do their jobs.

Discuss your recommendations with all employees who perform the job and consider their responses carefully. If you plan to introduce new or modified job procedures, be sure they understand what they are required to do and the reasons for the changes.

What else do I need to know before starting a job hazard analysis?

The job procedures discussed in this booklet are for illustration only and do not necessarily include all the steps, hazards, and protections that apply to your industry. When conducting your own job safety analysis, be sure to consult the Occupational Safety and Health Administration standards for your industry. Compliance with these standards is mandatory, and by incorporating their requirements in your job hazard analysis, you can be sure that your health and safety program meets federal standards. OSHA standards, regulations, and technical information are available online at www.osha.gov.

Twenty-four states and two territories operate their own OSHA-approved safety and health programs and may have standards that differ slightly from federal requirements. Employers in those states should check with the appropriate state agency for more information. A list of applicable states and territories and contact information is provided on page 32.

Why should I review my job hazard analysis?

Periodically reviewing your job hazard analysis ensures that it remains current and continues to help reduce workplace accidents and injuries. Even if the job has not changed, it is possible that during the review process you will identify hazards that were not identified in the initial analysis.

It is particularly important to review your job hazard analysis if an illness or injury occurs on a specific job. Based on the circumstances, you may determine that you need to change the job procedure to prevent similar incidents in the future. If an employee's failure to follow proper job procedures results in a "close call," discuss the situation with all employees who perform the job and remind them of proper procedures. Any time you revise a job hazard analysis, it is important to train all employees affected by the changes in the new job methods, procedures, or protective measures adopted.

When is it appropriate to hire a professional to conduct a job hazard analysis?

If your employees are involved in many different or complex processes, you need professional help conducting your job hazard analyses. Sources of help include your insurance company, the local fire department, and private consultants with safety and health expertise. In addition, OSHA offers assistance through its regional and area offices and consultation services. Contact numbers are listed at the back of this publication.

Even when you receive outside help, it is important that you and your employees remain involved in the process of identifying and correcting hazards because you are on the worksite every day and most likely to encounter these hazards. New circumstances and a recombination of existing circumstances may cause old hazards to reappear and new hazards to appear. In addition, you and your employees must be ready and able to implement whatever hazard elimination or control measures a professional consultant recommends.

Appendices

Appendix 1

Hazard Control Measures

Information obtained from a job hazard analysis is useless unless hazard control measures recommended in the analysis are incorporated into the tasks. Managers should recognize that not all hazard controls are equal. Some are more effective than others at reducing the risk.

The order of precedence and effectiveness of hazard control is the following:

1. Engineering controls.
2. Administrative controls.
3. Personal protective equipment.

Engineering controls include the following:

- Elimination/minimization of the hazard—Designing the facility, equipment, or process to remove the hazard, or substituting processes, equipment, materials, or other factors to lessen the hazard;
- Enclosure of the hazard using enclosed cabs, enclosures for noisy equipment, or other means;
- Isolation of the hazard with interlocks, machine guards, blast shields, welding curtains, or other means; and
- Removal or redirection of the hazard such as with local and exhaust ventilation.

Administrative controls include the following:

- Written operating procedures, work permits, and safe work practices;
- Exposure time limitations (used most commonly to control temperature extremes and ergonomic hazards);
- Monitoring the use of highly hazardous materials;
- Alarms, signs, and warnings;
- Buddy system; and
- Training.

Personal Protective Equipment—such as respirators, hearing protection, protective clothing, safety glasses, and hardhats—is acceptable as a control method in the following circumstances:

- When engineering controls are not feasible or do not totally eliminate the hazard;
- While engineering controls are being developed;
- When safe work practices do not provide sufficient additional protection; and
- During emergencies when engineering controls may not be feasible.

Use of one hazard control method over another higher in the control precedence may be appropriate for providing interim protection until the hazard is abated permanently. In reality, if the hazard cannot be eliminated entirely, the adopted control measures will likely be a combination of all three items instituted simultaneously.

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 (sprains and strains) 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

<i>Job Title:</i>	<i>Job Location:</i>	<i>Analyst</i>	<i>Date</i>
<i>Task #</i>	<i>Task Description:</i>		
<i>Hazard Type:</i>	<i>Hazard Description:</i>		
<i>Consequence:</i>	<i>Hazard Controls:</i>		
<i>Rational or Comment:</i>			

JSA Forms

Job Safety Analysis Worksheet

Company:

Plant Location:

Date Filed: / /

Job Task(s) Name:		Page ____ of ____	Date of Analysis: / /	Original _____ Repeat _____
Employee(s) Performing the Job:		Supervisor:		Analysis By:
Personal Protective Equipment:		Department:		Reviewed By:
Sequence of Basic Job Steps	Hazards Associated with Task	Possible Solutions to Hazards	Assigned to	

Job Safety Analysis Worksheet

Page 2

Job Steps	Hazards Associated with Task	Possible Solutions to Hazards	

Notes:

Job Safety Analysis Worksheet

Company:

Plant Location:

Date Filed: / /

Job Task(s) Name:		Page ____ of ____	Date of Analysis: / /	Original _____ Repeat _____
Employee(s) Performing the Job:		Supervisor:		Analysis By:
Personal Protective Equipment:		Department:		Reviewed By:
Sequence of Basic Job Steps	Hazards Associated with Task	Possible Solutions to Hazards	Assigned to	

Job Safety Analysis Worksheet

Page 2

Job Steps	Hazards Associated with Task	Possible Solutions to Hazards	

Notes:

Job Safety Analysis Worksheet

Company: _____

Plant Location: _____

Date Filed: / /

Job Task(s) Name:		Page ____ of ____	Date of Analysis: / /	Original _____ Repeat _____
Employee(s) Performing the Job:		Supervisor:		Analysis By:
Personal Protective Equipment:		Department:		Reviewed By:
Sequence of Basic Job Steps	Hazards Associated with Task	Possible Solutions to Hazards	Assigned to	

Job Safety Analysis Worksheet

Page 2

Job Steps	Hazards Associated with Task	Possible Solutions to Hazards	

Notes:

Job Safety Analysis Worksheet

Company: _____

Plant Location: _____

Date Filed: / /

Job Task(s) Name:		Page ____ of ____	Date of Analysis: / /	Original _____ Repeat _____
Employee(s) Performing the Job:		Supervisor:		Analysis By:
Personal Protective Equipment:		Department:		Reviewed By:
Sequence of Basic Job Steps	Hazards Associated with Task	Possible Solutions to Hazards	Assigned to	

Job Safety Analysis Worksheet

Page 2

Job Steps	Hazards Associated with Task	Possible Solutions to Hazards	

Notes:

Job Safety Analysis Worksheet

Company: _____

Plant Location: _____

Date Filed: / /

Job Task(s) Name:		Page ____ of ____	Date of Analysis: / /	Original _____ Repeat _____
Employee(s) Performing the Job:		Supervisor:		Analysis By:
Personal Protective Equipment:		Department:		Reviewed By:
Sequence of Basic Job Steps	Hazards Associated with Task	Possible Solutions to Hazards	Assigned to	

Job Safety Analysis Worksheet

Page 2

Job Steps	Hazards Associated with Task	Possible Solutions to Hazards	

Notes:

Job Safety Analysis Worksheet

Company:

Plant Location:

Date Filed: / /

Job Task(s) Name:		Page ____ of ____	Date of Analysis: / /	Original _____ Repeat _____
Employee(s) Performing the Job:		Supervisor:		Analysis By:
Personal Protective Equipment:		Department:		Reviewed By:
Sequence of Basic Job Steps	Hazards Associated with Task	Possible Solutions to Hazards	Assigned to	

Job Safety Analysis Worksheet

Page 2

Job Steps	Hazards Associated with Task	Possible Solutions to Hazards	

Notes:

Job Safety Analysis Worksheet

Company:

Plant Location:

Date Filed: / /

Job Task(s) Name:		Page ____ of ____	Date of Analysis: / /	Original _____ Repeat _____
Employee(s) Performing the Job:		Supervisor:		Analysis By:
Personal Protective Equipment:		Department:		Reviewed By:
Sequence of Basic Job Steps	Hazards Associated with Task	Possible Solutions to Hazards	Assigned to	

Job Safety Analysis Worksheet

Page 2

Job Steps	Hazards Associated with Task	Possible Solutions to Hazards	

Notes:
