Job Safety Analysis

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Michigan Occupational Safety & Health Administration
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MIOSHA
Michigan Occupational Safety and Health Administration

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Introduction 1

Job-related injuries and fatalities occur every day in the workplace. These injuries often occur because employees are not trained in the proper job procedure.

One way to prevent workplace injuries is to establish proper job procedures and train all employees in safer and more efficient work methods. Establishing proper job procedures is one of the benefits of conducting a job safety analysis carefully studying and recording each step of a job, identifying existing or potential job hazards (both safety and health), and determining the best way to perform the job or to reduce or eliminate these hazards. Improved job methods can reduce costs resulting from employee absenteeism and workers' compensation, and can often lead to increased productivity.

This booklet explains what a job safety analysis is and contains guidelines for conducting your own step-by-step analysis. A sample of a completed job safety analysis and a blank job safety analysis form are included at the back of this booklet.

It is important to note that the job procedures in this booklet are for illustration only and do not necessarily include all steps, hazards, or protections for similar jobs in industry. In addition, standards issued by Michigan Occupational Safety and Health Administration (MIOSHA) should be referred to as part of your overall job safety analysis. There are MIOSHA standards that apply to most job operations and also emphasize job safety analysis. Compliance with MIOSHA standards is mandatory.

Although this booklet is designed for use by supervisors, employees also are encouraged to use the information contained in this booklet to analyze their own jobs, be aware of workplace hazards, and report any hazardous conditions to their supervisors.

- Is the worker wearing personal protective clothing and equipment, including safety harnesses that are appropriate for the job?

A job safety analysis can be performed for all jobs in the workplace, whether the job task is special (non-routine) or routine. Even one-step-jobs such as those in which only a button is pressed can and perhaps should be analyzed by evaluating surrounding work conditions.

To determine which jobs should be analyzed first, review your job injury and illness reports. Obviously,

- **A job safety analysis should be conducted first for jobs with the highest rates of disabling injuries and illnesses.**

Also, jobs where close calls or near misses have occurred should be given priority. Analyses of new jobs and jobs where changes have been made in processes and procedures should follow. Eventually, a job safety analysis should be conducted and made available to employees for all jobs in the workplace.

Once you have selected a job for analysis, discuss the procedure with the employee performing the job and explain its purpose. Point out that you are studying the job itself, not checking on the employee's job performance. Involve the employee in all phases of the analysis from reviewing the job steps and procedures to discussing potential hazards and recommended solutions. You also should talk to other workers who have performed the same job.

- Are lockout procedures used for machinery deactivation during maintenance procedures?

Conducting the Job Safety Analysis	5

Before actually beginning the job safety analysis, take a look at the general conditions under which the job is performed and develop a checklist. Below are some sample questions you might ask.

- Are there materials on the floor that could trip a worker?
- Is lighting adequate?
- Are there any live electrical hazards at the jobsite?
- Are there any chemical, physical, biological, or radiation hazards associated with the job or likely to develop?
- Are tools including hand tools, machines, and equipment in need of repair?
- Is there excessive noise in the work area, hindering worker communication or causing hearing loss?
- Are job procedures known and are they followed or modified?
- Are emergency exits clearly marked?
- Are trucks or motorized vehicles properly equipped with brakes, overhead guards, backup signals, horns, steering gear, and identification, as necessary?
- Are all employees operating vehicles and equipment properly trained and authorized?
- Are employees wearing proper personal protective equipment for the jobs they are performing?
- Have any employees complained of headaches, breathing problems, dizziness, or strong odors?
- Is ventilation adequate, especially in confined or enclosed spaces?
- Have tests been made for oxygen deficiency and toxic fumes in confined spaces before entry?
- Are work stations and tools designed to prevent back and wrist injuries?
- Are employees trained in the event of a fire, explosion, or toxic gas release?

Naturally this list is by no means complete because each worksite has its own requirements and environmental conditions. You should add your own questions to the list. You also might take photographs of the workplace, if appropriate, for use in making a more detailed analysis of the work environment.

- Is the worker wearing clothing or jewelry that could get caught in the machinery or otherwise cause a hazard?

Nearly every job can be broken down into job tasks or steps. In the first part of the job safety analysis, list each step of the job in order of occurrence as you watch the employee performing the job.

Be sure to record enough information to describe each job action, but do not make the breakdown too detailed. Later, go over the job steps with the employee.

Figure 1 shows a worker performing the basic job steps for grinding iron castings.

Figure 1. Grinding Castings: Job Steps

1. Reach into metal box to right of machine, grasp casting, and carry to wheel.
2. Push casting against wheel to grind off burr.
3. Place finished casting in box to left of machine.

Identify Hazards	8

After you have recorded the job steps, next examine each step to determine the hazards that exist or that might occur. Ask yourself these kinds of questions.

- Are there hazards that would require the use of personal protective clothing and equipment that are appropriate for the job?
- Are work positions, machinery, pits or holes, and hazardous operations adequately guarded?
- Are lockout procedures used for machinery deactivation as required?
- Is the worker wearing clothing or jewelry, or have long hair that could get caught in the machinery or otherwise cause a hazard?
- Are there fixed objects that may cause injury, such as sharp edges?
- Is the flow of work organized (e.g., Is the worker required to make movements that are too rapid)?
- Can the worker get caught in or between moving parts?
- Can the worker be injured by reaching over moving machinery parts or materials?
- Is the worker at any time in an off-balance position?
- Is the worker positioned to the machine in a way that is potentially dangerous?
- Is the worker required to make movements that could lead to or cause hand or foot injuries, or strain from lifting the hazards of repetitive motions?
- Can the worker be struck by an object or lean against or strike a machine part of object?
- Can the worker fall from one level to another?
- Can the worker be injured from lifting or pulling objects, or from carrying heavy objects?
- Do environmental hazards (dust, chemicals, radiation, welding rays, heat, or excessive noise) result from the performance of the job?

Repeat the job observation as often as necessary until all hazards have been identified. Figure 2 shows basic job steps for grinding iron castings and any existing or potential hazards.

Figure 2. Grinding Castings: Hazards

1. Strike hand on edge. of metal box or casting; cut hand on burr. Drop casting on toes.
2. Strike hand against wheel. Flying sparks, dust, or chips. Wheel breakage. Not enough of wheel guarded. No dust removal system. Sleeves could get caught in machinery.
3. Strike hand against metal box or castings.

Recommending Safe Procedures and Protection	10

After you have listed each hazard or potential hazard and have reviewed them with the employee performing the job, determine whether the job could be performed in another way to eliminate the hazards, such as combining steps or changing the sequence, or whether safety equipment and precautions are needed to control the hazards. An alternative or additional procedure is to videotape the worker performing his or her job and analyze the job procedures.

If safer and better job steps can be used, list each new step, such as describing a new method for disposing of material. List exactly what the worker needs to know to perform the job using a new method. Do not make general statements about the procedure, such as “Be Careful.” Be as specific as you can in your recommendations.

You may wish to set up a training program using the job safety analysis to retrain your employees in the new procedures, especially if they are working with highly toxic substances or in hazardous situations. (Some OSHA standards require that formal training programs be established for employees.)

If no new procedure can be developed, determine whether any physical changes such as redesigning equipment, changing tools, adding machine guards, personal protective equipment, or ventilation will eliminate or reduce the danger.

If hazards are still present, try to reduce the necessity for performing the job or the frequency of performing it.

Go over the recommendations with all employees performing the job. Their ideas about the hazards and proposed recommendations may be valuable. Be sure that they understand what they are required to do and the reasons for the changes in the job procedures.

Figure 3 identifies the basic job steps for grinding iron castings and recommendations for new steps and protective measures.

Figure 3. Grinding Castings: New Procedure or Protection

1. Provide gloves and foot protection.
2. Provide larger guard over wheel. Install local exhaust system. Provide safety goggles. Instruct worker to wear short or tight-fitting sleeves.
3. Provide for removal of completed stock.

Revising the Job Safety Analysis | 12

A job safety analysis can do much toward reducing accidents and injuries in the workplace, but it is only effective if it is reviewed and updated periodically. Even if no changes have been made in a job, hazards that were missed in an earlier analysis could be detected.

If an illness or injury occurs on a specific job, the job safety analysis should be reviewed immediately to determine whether changes are needed in the job procedure. In addition, if a close call or near miss has resulted from an employee's failure to follow job procedures, this should be discussed with all employees performing the job.

Any time a job hazard analysis is revised, training in the new job methods, procedures, or protective measures should be provided to all employees affected by the changes. A job safety analysis also can be used to train effectively new employees on the steps and job hazards.

JOB SAFETY ANALYSIS TRAINING GUIDE

Job Title:	Page: ___ of	JSA No.	Date:	___New ___Revised
Equipment:	Supervisor:		Analysis by:	
Department:	Approved by:			

Required Personal Protective Equipment (PPE):

JOB STEPS	POTENTIAL HAZARDS	RECOMMENDED SAFE JOB PROCEDURES
Break down the job into its basic steps, e.g., what is done first, what is done next, and so on. You can do this by: 1. Observing the job 2. Discussing it with the operator 3. Drawing on your knowledge of job 4. A combination of the three Record the steps in their normal order of occurrence. Describe what is done, not the details of how it is done. Usually three or four words are sufficient to describe each basic job step. For example, the first basic job step in using a pressurized water fire extinguisher would be: 1. Remove the extinguisher from the wall bracket.	For each step, ask yourself what accidents could happen to the employee doing the job. You can get the answers by: 1. observing the job. 2. discussing it with the operator 3. recalling past accidents 4. a combination of the three Ask yourself; can he/she be struck by or contacted by anything; could they strike against or come in contact with anything; could the employee be caught in, on, or between anything; can they fall; be over exerted; or be exposed to anything injurious such as gas, radiation, welding rays, etc.? For example, acid burns, fumes.	For each potential accident or hazard, ask yourself what safeguards should be provided for the employee and how should the employee do the job step to avoid the potential accident, or what should they do or not do to avoid the accident. You can get your answers by: 1. observing the job for leads 2. discussing precautions with experienced job operators 3. drawing on your experience 4. a combination of the three Be sure to describe specifically the provided safeguards and precautions an employee must use. Don=t leave out important details. Number each separate recommended precaution with the same number you gave the potential accident (see center column) that the precaution seeks to avoid. Use simple do or don=t statements to explain recommended precautions as if you were talking to the employee. For example: Lift with your legs, not your back. Avoid generalities such as, Be careful, Be alert, Take caution, etc.

Trainee's Name:	Training Date:
Trainer's Name:	Trainer's Signature:

Four-Step Instruction Completed?

Prepare the Worker . . . . . Trainer's Initials
Present the Operation . . . . . Trainer's Initials
Try Out Performance . . . . . .Trainer's Initials
Follow Up . . . . . .Trainer's Initials

Comments:

GROUP EXERCISE

JOB SCENARIO

Work in groups using the following information to create a JSA.
When the class has finished, we will discuss the project.

- CINCINNATI HYDRAULIC PRESS BRAKE IN THE METAL FORMING DEPARTMENT
- THE JOB HAS JUST BEEN SET UP, THESE ARE THE FIRST PIECES OF A 1,200 PIECE PRODUCTION RUN
- ONE WORKER IS REQUIRED TO DO THIS JOB
- THE PRESS BRAKE IS ACTUATED AND SAFEGUARDED BY 2-HAND CONTROLS SECURED TO FRONT OF PRESS BRAKE ABOUT 48 INCHES FROM THE FLOOR.
- ONE PALLET OF BLANKS IS DELIVERED BY HILO, SET ON WORKBENCH ABOUT 40 INCHES HIGH 4 STACKS, 250 BLANKS PER STACK ARE SECURED BY BANDING TO THE PALLET
- THE BLANKS ARE 6 INCH x 12 INCH METAL AND WEIGHT ABOUT 2 POUNDS
- THE OPERATION CONSISTS OF MAKING ONE 90 DEGREE BEND LENGTHWISE IN THE BLANK
- THE DIE FIXTURE HOLDS THE PART SECURELY IN DIE
- FINISHED PARTS ARE STACKED IN A PARTS BIN SET ON THE FLOOR

JOB SAFETY ANALYSIS

Job Title:	Page: 1 of 2	JSA No. ____	Date:	____New ____Revised
Equipment:	Supervisor:		Analysis by:	
Department:			Reviewed by:	
Required Personal Protective Equipment (PPE):				

JOB STEPS	POTENTIAL HAZARDS	RECOMMENDED SAFE JOB PROCEDURES

JOB SAFETY ANALYSIS

Job Title:	Page: 2 of 2	JSA No.	Date:	__New __Revised
Equipment:	Supervisor:		Analysis by:	
Department:	Approved by:			
Required Personal Protective Equipment (PPE)				
JOB STEPS	POTENTIAL HAZARDS		RECOMMENDED SAFE JOB PROCEDURES	
Trainee's Name:			Training Date:	
Trainer's Name:			Trainer's Signature:	
Four-Step Instruction Completed?	Prepare the Worker . . . . . .Trainer's Initials Present the Operation . . . . . .Trainer's Initials Try Out Performance . . . . . .Trainer's Initials Follow Up . . . . . .Trainer's Initials			
Comments:				

SAMPLE JOB SAFETY ANALYSIS

Job Title: MACHINE OPERATOR	Page: 1 of 2	JSA No. 103	Date: 7-7-00	_x_ New ___ Revised
Equipment: CINCINNATI PRESS BRAKE	Supervisor: James Smith		Analysis by: James Smith and Louis Andres, Operator	
Department: METAL FORMING	Approved by: Rhonda Ames			
Required Personal Protective Equipment (PPE): Heavy gloves, Kevlar sleeves, safety glasses w/side shields, heavy work boot (steel toe optional).				

JOB STEPS	POTENTIAL HAZARDS	RECOMMENDED SAFE JOB PROCEDURES
1. Turn on press brake	Parts: tools, debris, electric shock Inside/outside press brake, floor area Flying pieces/slip, trip, fall	Good housekeeping; check area is clear of tools, parts, debris. Check flex cords for damage and exposed wiring. Wear PPE.
2. Test 2-hand controls	Point of operation Crush or amputate Finger, hand	Check operating selector - single stroke. Test controls-concurrent, anti-tie-down, anti-repeat, no bridging, protected from accidental activation. Test stop control.
3. Receive parts	Moving Hilo and stationary parts Struck by or crushed between Hilo and Press brake or table	Move out of way while Hilo is delivering parts so body is not in pinch point.
4. Cut banding	Sharp edges and release of coiled energy Lacerations Hands, arms, face, eyes	Use proper cutting tool.
5. Discard banding	Sharp edges and long, loose banding Lacerations/trip, fall Hands, arms, face, eyes	Wind up banding and deposit into-drum. Observe for tripping on loose bands.
6. Remove blank from stack	Sharp edges Lacerations, cuts Hands, fingers	Grasp along edges. Pull blank toward you.

Job Title: MACHINE OPERATOR	Page: 2 of 2	JSA No. 103	Date: 7-7-00	_X_ New ___ Revised
Equipment: CINCINNATI PRESS BRAKE	Supervisor: James Smith		Analysis by: James Smith	
Department: METAL FORMING			Reviewed by: Jane Martin	
Required Personal Protective Equipment (PPE): Heavy gloves, Kevlar sleeves, safety glasses w/side shields, heavy work boot (steel toe optional, face shield (steps 4 and 5).				

JOB STEPS	POTENTIAL HAZARDS	RECOMMENDED SAFE JOB PROCEDURES
7. Put blank in fixture	Same as #6 Part can fall from fixture	Locate securely in fixture
8. Actuate press brake	Point of operation, struck by metal debris Amputation, lacerations Fingers, hands, eyes	Use 2-hand control safeguards to actuate
9. Remove formed part	Same as #6	Same as #6
10. Place part in bin on floor	Bending to floor level, handling metal parts Strain, sprain, cuts, lacerations Back, shoulder, fingers, hands	Use safe lifting techniques. (See Comments) (Short-term solution until work station is adapted according to good ergonomic guidelines)

Trainee's Name:	Training Date:
Trainer's Name:	Trainer=s Signature:

Four-Step Instruction Completed?
Prepare the Worker. . . . . Trainer's Initials
Present the Operation . . . . . Trainer's Initials
Try Out Performance. . . . . Trainer's Initials
Follow Up . . . . . Trainer's Initials

Comments: Refer to Safe Back Training module.

SAMPLE JOB SAFETY ANALYSIS
GRINDING CASTINGS

STEP	HAZARD	CAUSE	PREVENTIVE MEASURE
1. Reach into right box and select casting	Strike hand on wheel	Box is located beneath wheel	Relocate and select casting side of wheel
	Tear hand on corner of casters	Corners of casters are sharp	Require wearing of leather gloves
2. Grasp casting, lift and position	Strain shoulder/elbow by lifting with elbow extended	Box too low	Place box on pallet
	Drop casting on toe during positioning	Slips from hand	Require wearing of safety shoes
3. Push casting against wheel and grind burr	Strike hand against wheel	Wheel guard is too small	Provide larger guard with tongue guard and work rest
	Wheel explodes	Incorrect wheel installed	Check rpm rating of wheel
		Cracked wheel	Inspect wheel for cracks
	Flying sparks/chips	Wheel friction with caster	Require wearing of eye goggles
	Respirable dust	Dust from caster metal and wheel material	Provide local exhaust system
	Sleeves caught in machinery	Loose sleeves	Require tight or short sleeves
4. Place finished casting into box	Strike hand on castings	Buildup of completed stock	Remove completed stock routinely

SAMPLE JOB SAFETY ANALYSIS

JOB TITLE (AND NUMER IF APPLICABLE): STOCK LOADING PAGE 1 JSA NO. 103		DATE: 1-1-95	___ NEW ___ REVISED
TITLE OF PERSON WHO DOES JOB: LOADER		SUPERVISOR: JAMES SMITH	ANALYSIS BY: JAMES SMITH
COMPANY/ORGANIZATION: METAL FABRICATING CORP.	PLANT/LOCATION: CHICAGO	DEPARTMENT: PACKAGING	REVIEWED BY: JOHN MARTIN
REQUIRED AND/OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT: GLOVES, SAFETY SHOES, SAFETY GLASSES, HARD HATS			APPROVED BY: JOE BOTTAN

SEQUENCE OF BASIC JOB STEPS	POTENTIAL HAZARDS	RECOMMENDED ACTION OR PROCEDURE
1. REMOVE BOX FROM CONVEYOR AND PLACE ON TRUCK.	1a. HEAVY BOXES & IMPROPER HAND PLACEMEN OR (MASHED FINGERS, HIT ELBOWS, STRAINS).	1a. USE PALMAR GRIP, GRASP BOTTOM WITH ONE HAND ON BOTTOM FRONT CORNER AND OTHER HAND ON TOP OPPOSITE CORNER OF OTHER END. KEEP ONE ELBOW INTO SIDE. TURN BODY INSTEAD OF TWISTING.
	1b. SPLINTERS (PUNCTURES).	1b. WEAR GLOVES.
	1c. HEAVY BOXES, POOR GRIP, & IMPROPER SHOES (FOOT INJURIES).	1c. WEAR HARD TOE SHOES.
	1d. UNGUARDED V-BELT (HAND INJURIES).	1d. GUARD V-BELT WITH ENCLOSURE AND KEEP IN PLACE.
	1e. TRUCK PARKED TOO CLOSE OR TOO FAR FROM WORK AREA.(STRAINS, BOXES CROPPED ON FEET, (SLIPS/TRIPS/FALLS).	1e. PARK TRUCK AT A DISTANCE AWAY NOT REQUIRED TO TWIST THE BODY AND SO THAT YOU HAVE ENOUGH WORKING ROOM TO AVOID BUMPING INTO THE CONVEYOR OR TRUCK.

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SAMPLE JOB SAFETY ANALYSIS

JOB SAFETY ANALYSIS

SAMPLE

Page 2

JOB TITLE (and number if applicable): STOCK LOADING PAGE 2 OF 4 JSA NO. 103		DATE: 1-1-95	X NEW ___ REVISED
TITLE OF PERSON WHO DOES JOB: LOADER		SUPERVISOR: JAMES SMITH	ANALYSIS BY: JAMES SMITH
COMPANY/ORGANIZATION: METAL FABRICATING CORP.	PLANT/LOCATION: CHICAGO	DEPARTMENT: PACKAGING	REVIEWED BY: JOHN MARTIN
REQUIRED AND/OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT: GLOVES, SAFETY SHOES, SAFETY GLASSES, HARD HATS			APPROVED BY: JOE BATTON

SEQUENCE OF BASIC JOB STEPS	POTENTIAL HAZARDS	RECOMMENDED ACTION OR PROCEDURE
CONT=D FROM PAGE 1.	1f. OBJECTS ON FLOOR. (SLIPS/TRIPS/FALLS).	1f. OBSERVE AREA FOR SLIPPING
2. PUSH LOADED TRUCK.	2a. OVERLOADED TRUCK & WORN CASTERS (STRAINS WHILE (PUSHING).	2a. IF TRUCK WILL NOT MOVE BY USING BODY WEIGHT AGAINST IT, GET POWERED EQUIPMENT, REMOVE PART OF LOAD, OR SECURE ASSISTANCE.
	2b. HANDS ON SIDE OF TRUCK.	2b. KEEP HANDS ON END OF TRUCK.
	2c. PULLING TRUCK (RUN OVER FOOT).	2c. PUSH, NEVER PULL.
	2d. BOXES STACKED TOO HIGH & UNBALANCED. (FOOT INJURIES).	2d. STACK BOXES ORDERLY & NO HIGHER THAN NORMAL EYE LEVEL.
	2e. OBJECTS ON FLOOR. (SLIPS/TRIPS/FALLS).	2e. OBSERVE FOR SLIPPING/ TRIPPING HAZARD WHEN TRAVELING.

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JOB SAFETY ANALYSIS

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