The Job Hazard Analysis

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March 18, 2011

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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.

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What Is It?

JA- Job Analysis

1930s process for doing job time studies was found to have safety benefits.

"Match the job to the man."

JB- Job Breakdown

WWII process to train inexperienced workers in wartime industrial production.

JSA- Job Safety Analysis

First mentioned around 1950, by Bethlehem Steel; the steel industry first did these analyses.

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What Is It?

JHA – Job Hazard Analysis

Sometimes used today to include an analysis of many types of hazards, (safety, environmental, quality, etc.)

Analyzing the hazards, not the safety.

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Hazard Analysis Benefits

The analysis:

- Increases employee hazard recognition and awareness
- Standardizes operations based on acceptable safe practices
- Identifies appropriate Personal Protective Equipment (PPE)
- Allows formal documentation of employee's knowledge of the job requirements.

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Hazard Analysis Benefits

The analysis can also help with:

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

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OSHA Requirements

- General Duty Clause 5(a)(1)
- Many OSHA Standards require hazard analysis:
  - Emergency Action Plans
  - Hazcom
  - PPE
  - Lockout / Tagout
  - Confined Spaces
- Injury & Illness Prevention Plan (I2P2) ?

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OSHA JHA Booklet

- Available online as a pdf file
- Covers only the basics

Who needs to read this booklet?

What is a hazard?

What is a job hazard analysis?

Why is job hazard analysis important?

What is the value of a job hazard analysis?

What jobs are appropriate for a job hazard analysis?

Where do I begin?

How do I identify workplace hazards?

How do I correct or prevent any hazards?

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

Why should I review my job hazard analysis?

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

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Definitions

HAZARD

An object, condition or pratice which has the potential to cause undesired consequences (injury, illness, loss or damage).

"*Something potentially harmful*"

EXPOSURE

Contact between hazard and somebody (or something).

Without exposure to the hazard there is no risk!

RISK

Chance of an undesired consequence (injury, illness, loss or damage) due to exposure to a hazard.

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HAZARD

Lion

Injury – Bite
Illness – Rabies
Loss / Damage – Ripped Cloths or equipment damage

EXPOSURE

Three men in truck in presence / proximity of lion.

RISK

Chance /probability of an undesired consequence

Lion attack

The size of RISK is the CHANCE (PROBABILITY) of a dangerous event happening multiplied by the EFFECT (SEVERITY) of any harm caused.

In this case the Risk was HIGH

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HAZARD

EXPOSURE

RISK

Low Risk

Medium Risk

High Risk

Very High Risk

?

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Risk = Probability x Severity

Risk is a function of two variables: Probability (sometimes called Frequency) and Severity. The greater the probability or severity - the higher the risk.

To create a JHA, you must decide what the severity and probability is for each hazard.

Many companies use a matrix to illustrate the Severity x Probability = Risk

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Risk Rating Table

		Severity					
		Close Call	First Aid	Lost Time	Irreversible		
Frequency		1	3	6	10	Probability	
Monthly	1	**1**	**3**	**6**	**10**	1	Unlikely
Weekly	2	**4**	**12**	**24**	**40**	2	Possible
Daily	4	**16**	**48**	**96**	**160**	4	Probable
Hourly	6	**36**	**108**	**216**	**360**	6	Certain

Risk Rating Table

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Risk Level

Minimal	**Minimal Risk Identified** - Controls are in-place. Utilize continuous improvement teams to advance controls to "best practice" stage.
Low	**Limited Risk Identified** - Implement Administrative controls / mid range preventative measures (ex. SOP's, Job Rotation, Communications, PPE). Research methods to engineer out hazards or risk.
Medium	**Moderate Risk identified** - Immediate corrective / preventative measures need to be implemented. Implement Engineering and Administrative controls and re-revaluate task prior to re-introduction
High	**Heightened Risk Potential Identified** - Elevate to Regional EH&S Manager for review. Eliminate hazards, exposures, frequency. Implement Engineering controls or Substitution and re-revaluate task prior to re-introduction

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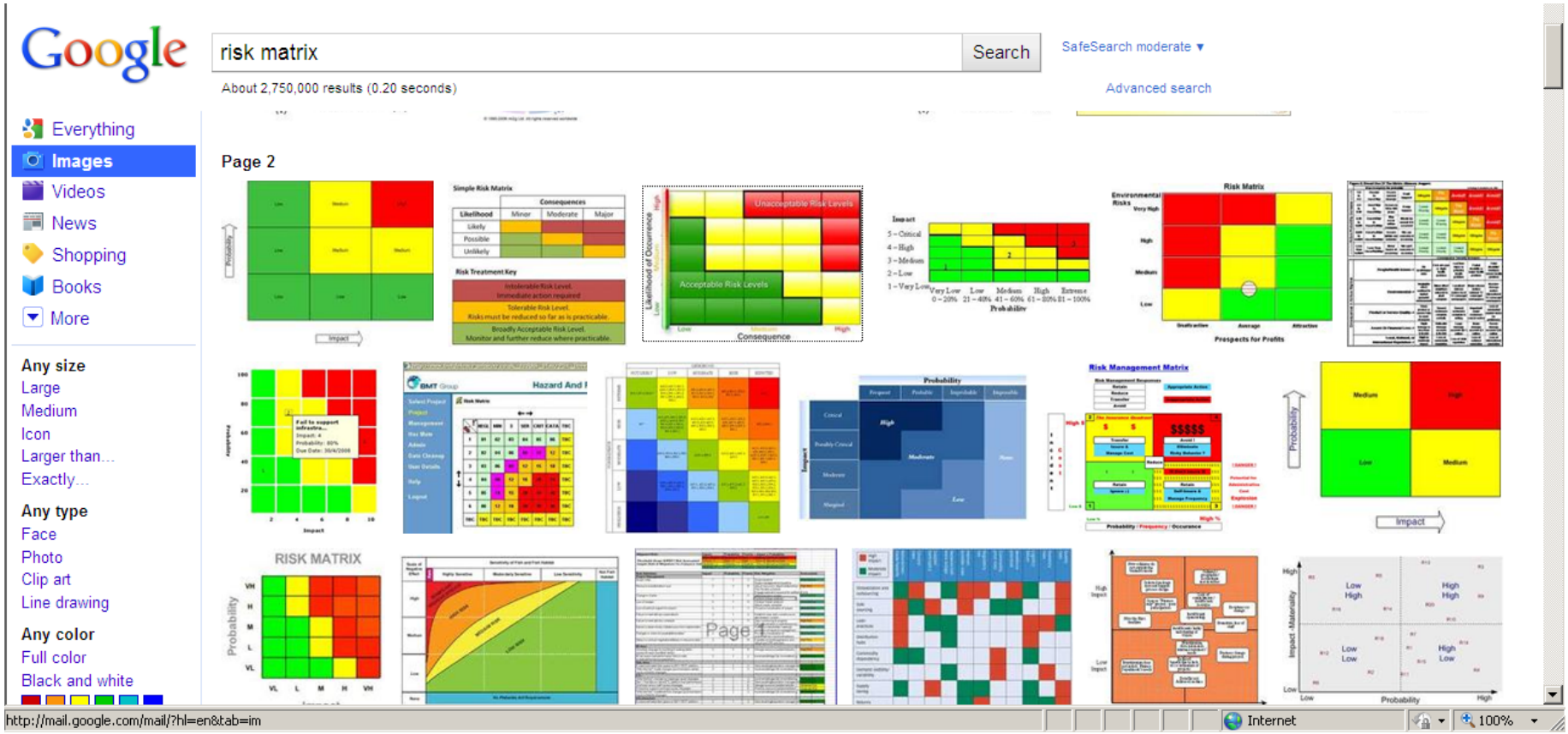
Risk Matrix
Severity / Frequency



Develop the best one for YOU

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Job Safety Analysis Worksheet	Date:
Title of Job/Operation:	Log Number:
Employee Name and Job Title:	Analyst and Date:
Division/Bureau/Section:	Approved By and Date:
Personal Protective Equipment required or recommended:	

Job Steps	**Hazards**	**Recommended Safe Job Procedures**

JSA Example

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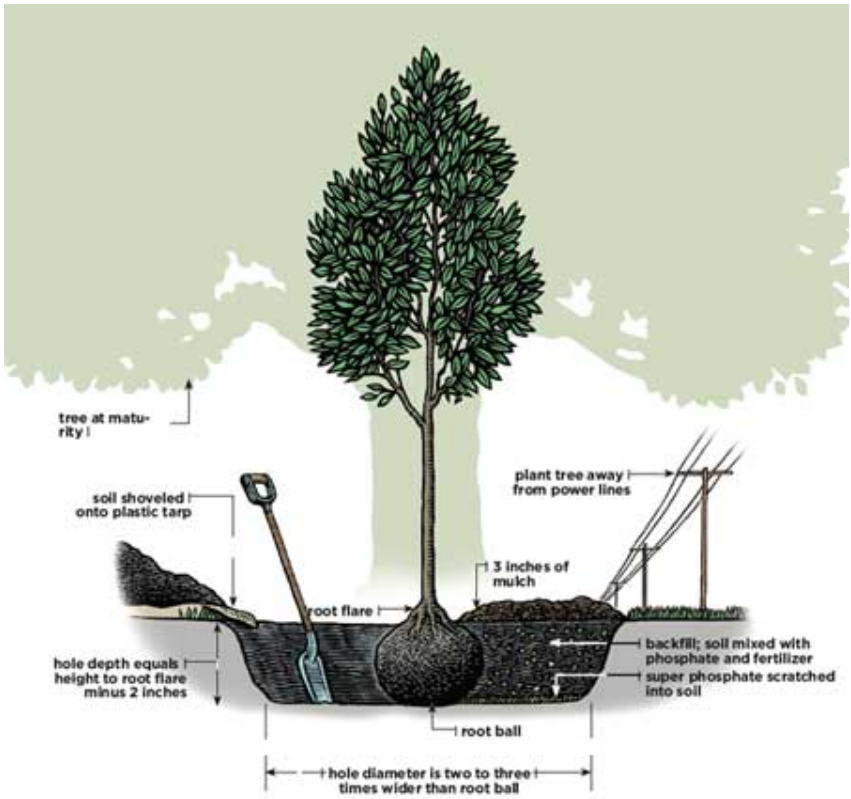
Defining Step of a Process

Example: (Task) Planting a Tree

Steps:

1. *Dig a hole*
2. *Insert tree*
3. *Backfill hole*

Right level of steps?



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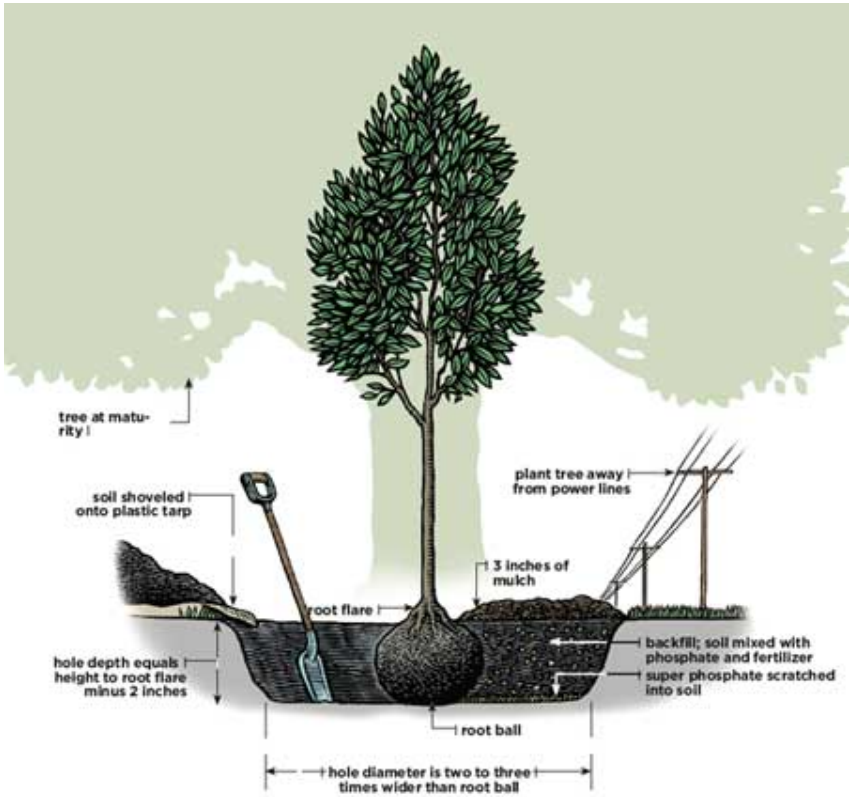
Defining Step of a Process

Example: (Task) Planting a Tree

Steps:

1. *Select site.*
2. *Obtain shovel from shed.*
3. *Carry shovel to selected site.*
4. *Hold shovel upright.*
5. *Place shovel on ground.*
6. *Place right foot on shovel.*
7. *Push on shovel with foot.*
8. *Pull back on shovel.*

Right level of steps?



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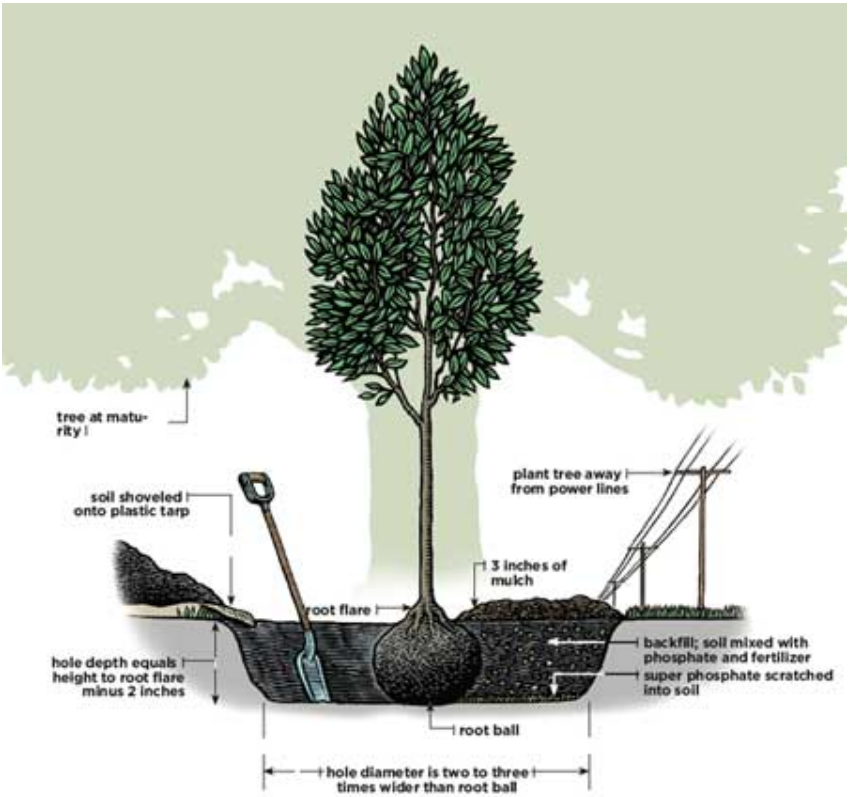
Defining Step of a Process

Example: (Task) Planting a Tree

Steps:

1. *Obtain tools from storage.*
2. *Dig hole.*
3. *Prepare hole.*
4. *Position tree in hole.*
5. *Backfill and tamp.*
6. *Brace tree.*
7. *Return tools from storage.*



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Right level of steps?

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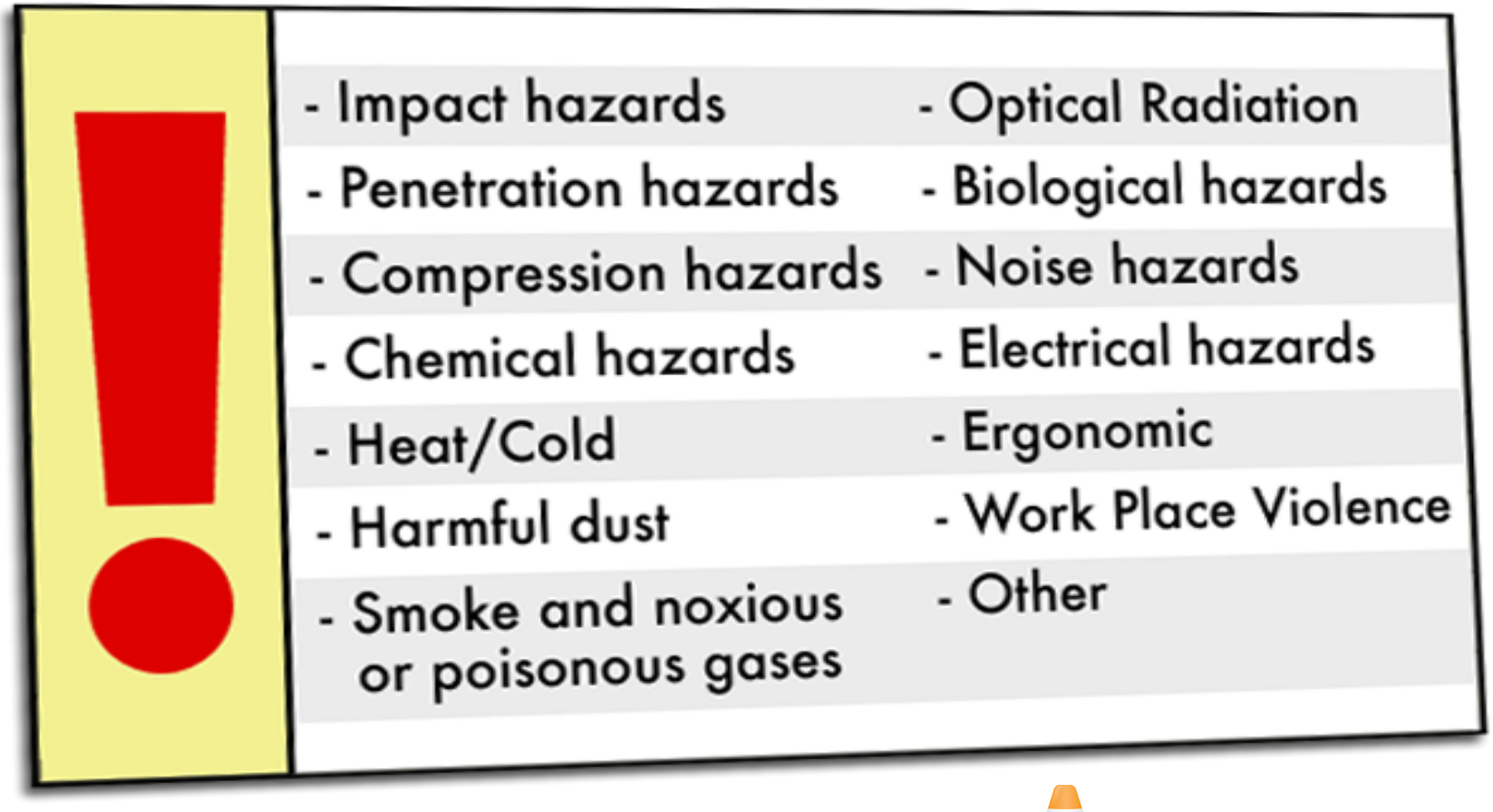
Types of Workplace Hazards



- Impact hazards
- Penetration hazards
- Compression hazards
- Chemical hazards
- Heat/Cold
- Harmful dust
- Smoke and noxious or poisonous gases
- Optical Radiation
- Biological hazards
- Noise hazards
- Electrical hazards
- Ergonomic
- Work Place Violence
- Other

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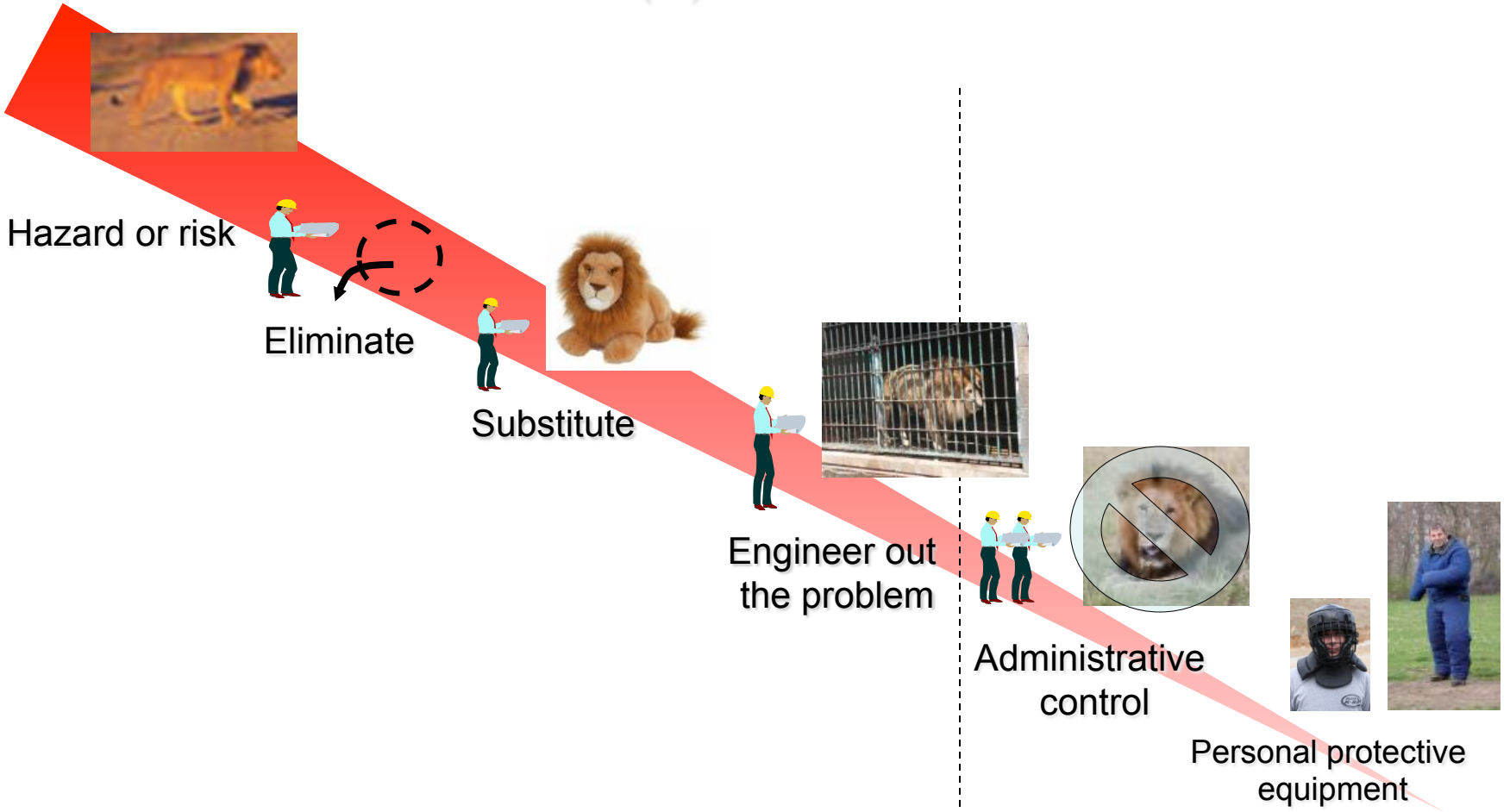
Hierarchy of Controls

Procedure(s) to Use in JHA



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Which Jobs To Do First?

Prioritizing the JHAs

1. Jobs with the highest injury, illness close call rates
2. Jobs that have the potential to cause serious injury
3. Jobs in which one simple human error could cause injury
4. Jobs complex enough to have written instructions
5. Jobs that are new to you facility
6. Jobs that significantly had changes in process technology or procedures

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Employee Involvement

- Reasons for involving employees:
  - Familiar with the job
  - They can Identify hazards not observable by others.
  - Gains “buy-in” for necessary changes.

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Members of the Team

- Typical members:
  - Safety manager
  - Safety team members
  - Employees
  - Supervisors
  - Human Resources
  - Engineering

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Job Safety Analysis Worksheet	Date:
Title of Job/Operation:	Log Number:
Employee Name and Job Title:	Analyst and Date:
Division/Bureau/Section:	Approved By and Date:
Personal Protective Equipment required or recommended:	

Job Steps	**Hazards**	**Recommended Safe Job Procedures**

JSA Example

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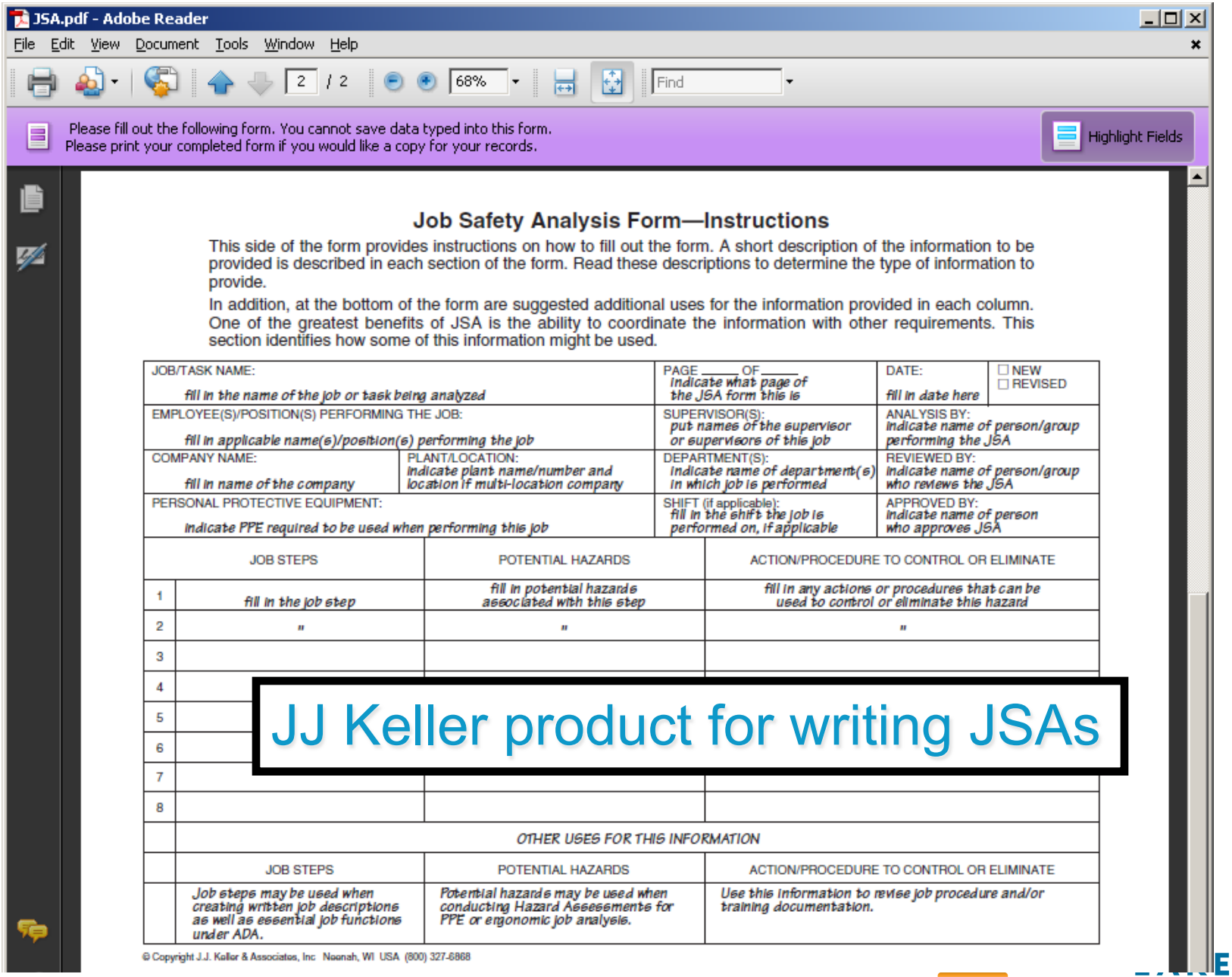

ACTIVITY HAZARDS ANALYSIS

Print Form

Date: Project:

Activity:

Activity Location:

Prepared By:

Overall Risk Assessment Code (RAC)
(Use highest code)

Risk Assessment Code Matrix

E = Extremely High Risk
H = High Risk
M = Moderate Risk
L = Low Risk

Severity	Probability				
	Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	E	E	H	H	M
Critical	E	H	H	M	L
Marginal	H	M	M	L	L
Negligible	M	L	L	L	L

Add Identified Hazards

	JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC
X				
X				
X				

Add Items

	EQUIPMENT	TRAINING	INSPECTION
X			
X			
X			

Involved Personnel:

Acceptance Authority (digital signature):

NWW Form 385-1 (Revised) April 2008

Reset Form

US Army Corps of Engineers

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Risk Analysis Worksheet

Site:	
Cell / Area:	
Assets / Equipment:	
High Level Task Description (inc.start & stop points)	

Groups at Risk (Mark each Group)	
Employees	
Contractors	
Maintenance	
Visitors	
Young People (<18)	
Pregnant Women	

Assessment Team:

Task Hazard Analysis Ref. #.

Date:

Revision:

	Y	N
F	1 2 4 6	
P	1 2 4 6	

Reviewed / Approved By:	
Additional - Specialized Assessment Reference:	

Step #	Process Step / Description	Hazard Present	Potential Harm or Effect	Recommended Controls (Not inclusive)	Current Controls In-place at Site	Global Best Practice (Y or N)	Severity	Frequency	Probability	RPN	(Risk Abatement) Action Items / Additional Controls Identified	Owner	Due Date	(Y Completed or N)	Post - Frequency	Post -Probability	Post - RPN

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Site:	
Cell / Area:	
Assets / Equipment:	
High Level Task Description (inc.start & stop points)	(Enter High Level Trask Description Here)

Groups at Risk (Mark each Group)	
Employees	
Contractors	
Maintenance	
Visitors	
Young People (<18)	
Pregnant Women	

Assessment Team:

Task Hazard Analysis Ref. #.

Date:

Revision:

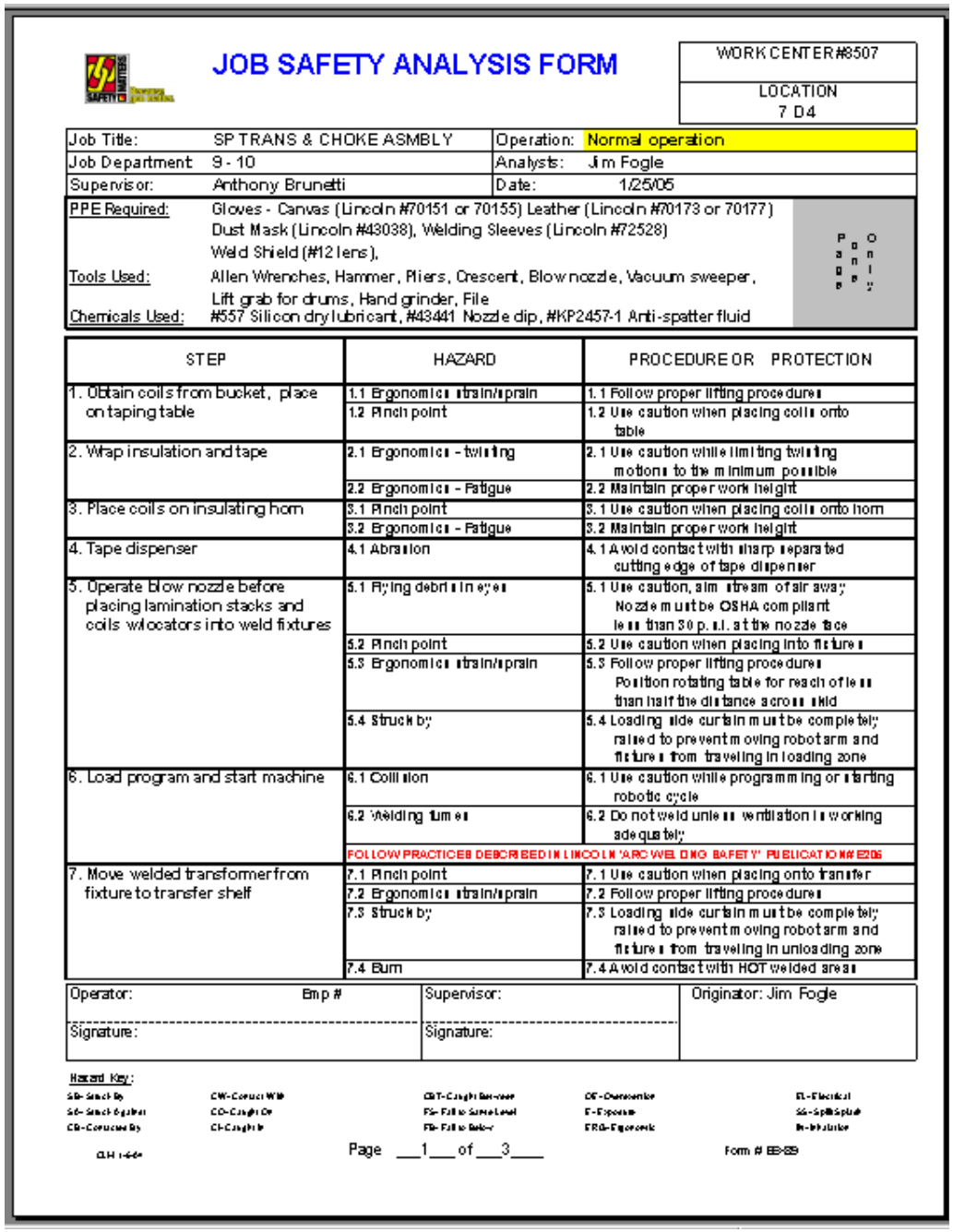
Reviewed / Approved By:	
Additional - Specialized Assessment Reference:	

Step #	Picture	Process Step / Description	Tools and Equipment	Procedures, Policies	Hazard Present	Hazard Site Specific Detail	Potential Harm or Effect	Recommended Controls (Not inclusive)	Current Controls In-place at Site	Global Best Practice (Yes or No)	Severity	Frequency	Probability	RPN	(Risk Abatement) Action Items / Additional Controls Identified	Owner	Due Date	Completed (Y or N)	Post - Frequency	Post -Probability	Post - RPN
	(Resize picture height to 1")																				

Step # | Picture | Process Step / Description | Tools and Equipment

Global Best Practice (Yes or No) | Severity | Frequency | Probability | RPN | (Risk Abatement) Action Items / Additional Controls Identified | Owner | Due Date | Completed (Y or N) | Post - Frequency | Post -Probability | Post - RPN

Hazard Present | Hazard Site Specific Detail | Potential Harm or Effect | Recommended Controls (Not inclusive) | Current Controls In-place at Site



JOB SAFETY ANALYSIS FORM

WORK CENTER #8507

LOCATION
7 D4

Job Title:	SP TRANS & CHOKE ASMBLY	Operation:	Normal operation
Job Department:	9 - 10	Analysts:	Jim Fogle
Supervisor:	Anthony Brunetti	Date:	1/25/05

PPE Required: Gloves - Canvas (Lincoln #70151 or 70155) Leather (Lincoln #70173 or 70177) Dust Mask (Lincoln #43038), Welding Sleeves (Lincoln #72528) Weld Shield (#12 lens),

Tools Used: Allen Wrenches, Hammer, Pliers, Crescent, Blow nozzle, Vacuum sweeper, Lift grab for drums, Hand grinder, File

Chemicals Used: #557 Silicon dry lubricant, #43441 Nozzle dip, #KP2457-1 Anti-spatter fluid

Page One Only

STEP	HAZARD	PROCEDURE OR PROTECTION
1. Obtain coils from bucket, place on taping table	1.1 Ergonomics strain/sprain	1.1 Follow proper lifting procedures
	1.2 Pinch point	1.2 Use caution when placing coils onto table
2. Wrap insulation and tape	2.1 Ergonomics - twisting	2.1 Use caution while limiting twisting motions to the minimum possible
	2.2 Ergonomics - Fatigue	2.2 Maintain proper work height
3. Place coils on insulating horn	3.1 Pinch point	3.1 Use caution when placing coils onto horn
	3.2 Ergonomics - Fatigue	3.2 Maintain proper work height
4. Tape dispenser	4.1 Abrasion	4.1 Avoid contact with sharp separated cutting edge of tape dispenser
5. Operate blow nozzle before placing lamination stacks and coils w/locators into weld fixtures	5.1 Flying debris in eyes	5.1 Use caution, aim stream of air away; Nozzle must be OSHA compliant less than 30 p.s.i. at the nozzle face
	5.2 Pinch point	5.2 Use caution when placing into fixtures
	5.3 Ergonomics strain/sprain	5.3 Follow proper lifting procedures Position rotating table for reach of less than half the distance across shld
	5.4 Struck by;	5.4 Loading side curtain must be completely raised to prevent moving robot arm and fixtures from traveling in loading zone
6. Load program and start machine	6.1 Collision	6.1 Use caution while programming or starting robotic cycle
	6.2 Welding fumes	6.2 Do not weld unless ventilation is working adequately;
	FOLLOW PRACTICES DESCRIBED IN LINCOLN "ARC WELDING SAFETY" PUBLICATION # E205	
7. Move welded transformer from fixture to transfer shelf	7.1 Pinch point	7.1 Use caution when placing onto transfer
	7.2 Ergonomics strain/sprain	7.2 Follow proper lifting procedures
	7.3 Struck by;	7.3 Loading side curtain must be completely raised to prevent moving robot arm and fixtures from traveling in unloading zone
	7.4 Burn	7.4 Avoid contact with HOT welded areas

Operator: Emp #	Supervisor:	Originator: Jim Fogle
Signature:	Signature:	

Hazard Key:

SB- Struck By; SA- Struck Against; CB- Contact By; CW- Contact With; CO- Caught On; CI- Caught In; CBT- Caught Between; FS- Fall to Same Level; FB- Fall to Below; OE- Overexertion; E- Exposure; ERG- Ergonomic; EL- Electrical; SG- Splash/Spatter; IN- Inhalation

CLH 1-04

Page 1 of 3

Form # EE-SS

2005 Lincoln Electric JSA

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2011
Lincoln Electric
JHA

2.0 (Approved) 10/11/2010
CRW E4357

Job Hazard Analysis Form

Operation: 1. Common Operations for all Weld Centers
Job Department: Multiple, Machine Division
Location: Euclid Machine Manufacturing, Ohio
Tools Used: Hoists; Walking lift trucks; Carts; Rawhide hammer; Lead hammer; Lixie hammer ; Ball peen hammer; Pallet jack; (Allen, box, crescent or open-end) Wrenches; Air chisels ; Wire brushes; Wire wheels; Wire cutters; Screwdriver; Slings; Chains; Designated lifting devices; Pliers; Channel locks; Grinder; Impact gun; Belt sanders; Files; Air Nozzle
Chemicals Used: Nozzle dip 43441(MISC_1248); anti-spatter spray 40082 (MISC_1249); Spectra Air Filter with pre-coating 42290, 42742
Job Name: Manual/ Robotic Welding
Document Number: JHA 1011
Team Members: Frank Dragolich; M. Chiro; T. Brunetti; M. Albright; B. Siktberg; J. Buday; D. Shimko; J. Hamilton; L. Hellings
Date: 10/11/2010
PPE Required: Gloves: Canvas (43026)(43027), Short Cuff Gauntlet (43033), Long Cuff Gauntlet (43034), Hyflex Foam (43045)(45073); Welding Shield with welding lens; Welding leathers; Welding skullcaps; Welding sleeve (43048), Dust mask (71517)

Steps	Hazards, Risks and Risk Reductions Involving You, your Co-workers, the Facilities and the Environment							
	Hazards	Risks When Reduction Procedures and/or Protections ARE NOT Used			Risk Reduction Procedures and/or Protections	Remaining Risks Even When Reduction Procedures and/or Protections ARE Used		
		Severity	Frequency	Risk		Severity	Frequency	Risk
1. Start up at beginning of shift. Inspect work center before turning on welder	1. Electrical shock	Major	Low	Low	1. Inspect work center before turning on welder. 2. Confirm insulation on welding cables is not damaged, exposing bare wire. 3. Confirm cables are tightly connected to machine and work surface. 4. Confirm welding gun or electrode holder is not damaged. 5. Verify no cables are laying in wet areas. 6. Electrical Safety training.	Major	Very Low	Low
2. Handle appropriate fixture and mount to workbench or positioner	1. Pinch point	Moderate	Likely	Moderate	1. Keep hands and fingers away from pinch areas.	Minor	Very Low	Negligible
	2. Sprains and strains	Major	Moderate	Moderate	1. Use proper lifting techniques. 2. Use material handling and lifting devices when provided at work cell.	Minor	Very Low	Negligible
	3. Impact injuries from dropping object on foot/toes	Major	Low	Low	1. Use slings or chains that are rated for the load being lifted. 2. Employee awareness and on-the-job training.	Moderate	Very Low	Negligible

When printed, this document is uncontrolled.

Employees must also use JHA 4000, for Universal Hazards, with this document.

Hazard Risk Scale
Severity: Minor to Catastrophic
Frequency: Very Low to High
Risk: Negligible, Low, Moderate, High

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Steps	Hazards, Risks and Risk Reductions Involving You, your Co-workers, the Facilities and the Environment							
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Severity

Code	Description
4	Catastrophic
3	Major
2	Moderate
1	Minor

Frequency

Code	Description
5	High
4	Likely
3	Moderate
2	Low
1	Very Low

Risk

Code	Description
H	High
M	Moderate
L	Low
N	Negligible

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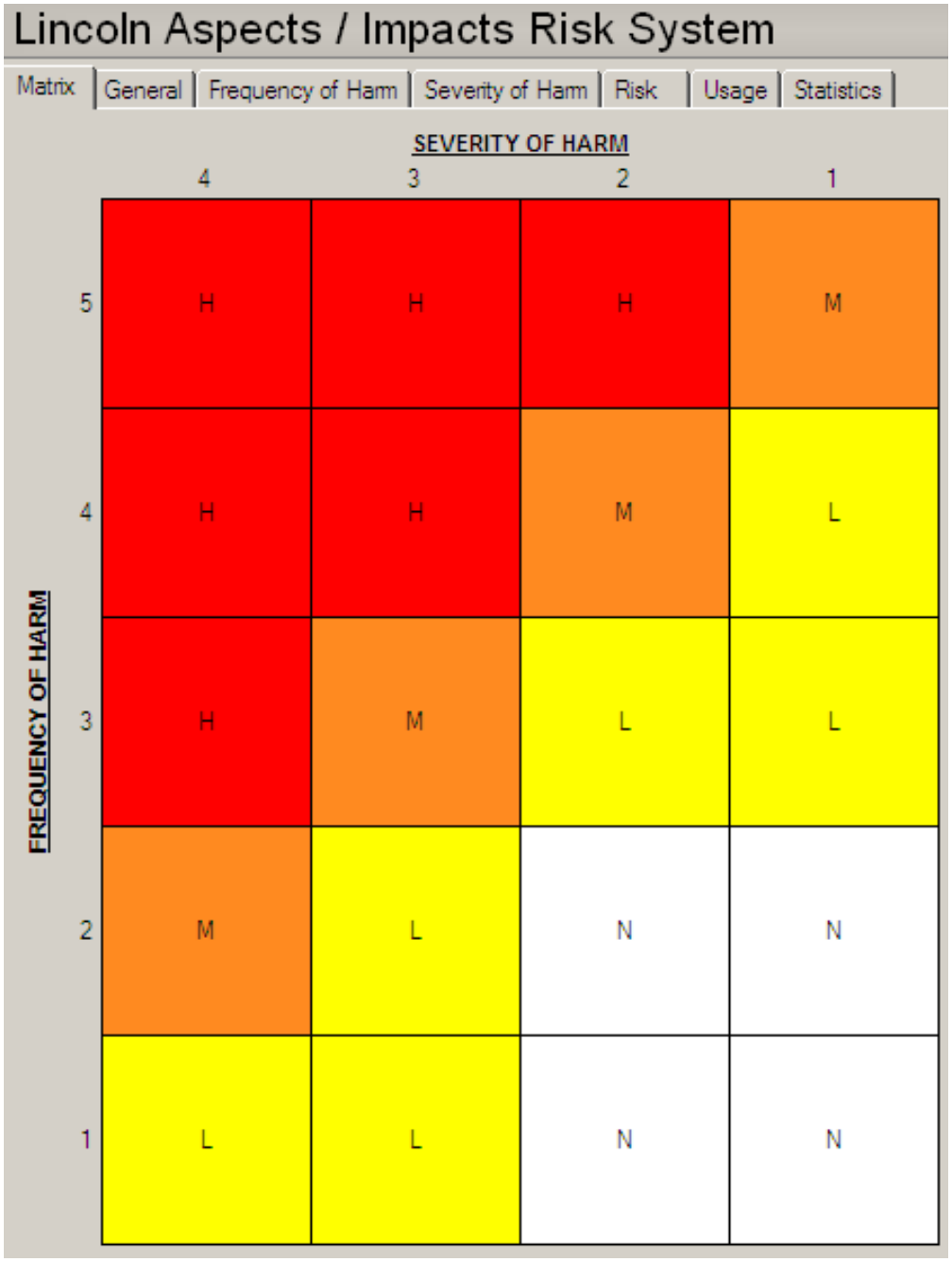

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Code	Description
H	High
M	Moderate
L	Low
N	Negligible

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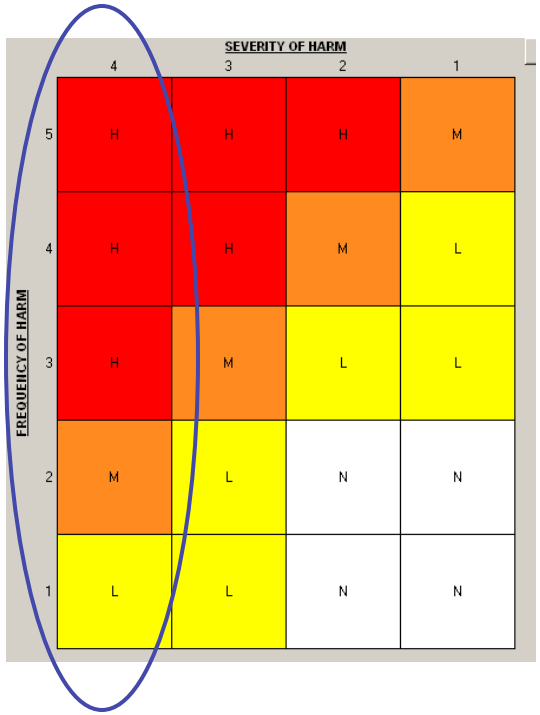
Frequency of Accidents Occurring		
Likelihood Code	Probability of Accident	Rough Time Scale of Likelihood
1 – Very Low	Very unlikely to occur	> 50 years
2 – Low	Unlikely to occur	> 10 years ≤ 50 years
3 – Moderate	Possible over long periods of time	>1 year ≤ 10 years
4 – Likely	Likely to happen given sufficient time	>10 days ≤ 1 year
5 – High	Highly likely; could happen soon	≤ 10 days



Frequency (Probability)

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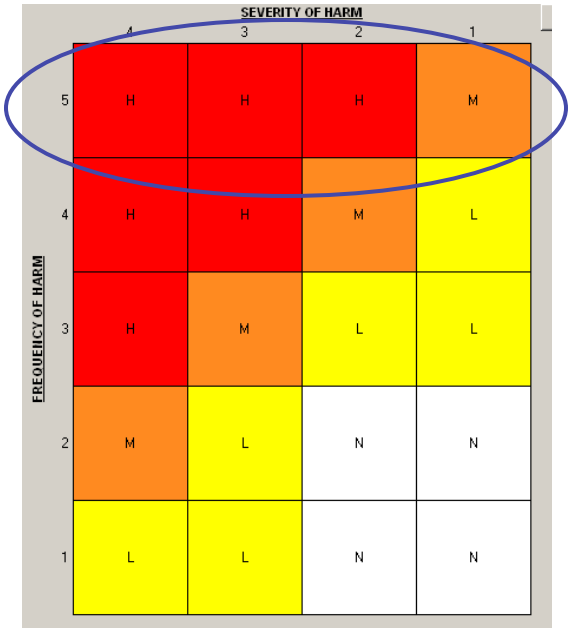
Severity of Consequences				
Description	Personnel Illness/Injury	Equipment Loss ($)	Down Time	Environmental Effect
1 – Minor	First aid or minor medical treatment. This would NOT be a defined OSHA recordable. Examples include: small cuts, bruises, slips and falls with little injury	< 1K	<1 day	Minimal environmental damage. No violation of a law or regulation. (Readily repaired requiring <$1k to correct)
2 – Moderate	A defined OSHA recordable injury with NO lost workdays. Medical treatment beyond First Aid and job restrictions would be in this category. Examples include: cuts requiring stitches, fractures, painkillers and antibiotics prescribed, and any injury that would prevent an employee from performing their regular job function for a period of time.	1K to 200K	1 day to 2 weeks	Mitigatible, short-term environmental damage. No violation of a law or regulation. (Restoration activities can repair (<1 yr) environmental damage or requiring $1K-$200K)
3 – Major	A defined OSHA Lost Workday case. Any injury where the employee would likely miss time from work would fall into this category. Examples include: serious back injury, fracture, hospitalization for treatments. Some injuries could fall in either the Moderate or Major categories, depending upon the hazard in the job being evaluated, and the likelihood that the employee will be able to remain at work during the healing process.	200K to 1M	2 weeks to 4 months	Mitigable, medium-term environmental damage. A violation of a law or regulation has taken place. (Restoration activities can repair environmental damage in (1 to 5 yrs) or requiring $200K-1M to correct and/or in penalties)
4 – Catastrophic	An injury resulting in a near or full amputation, permanent disability, simultaneous injury to three or more people, or death.	>1M	> 4 months	Irreversible or long-term environmental damage. Violation of an environmental law. (Environmental damage can be repaired (5 yrs or greater) or requiring >$1M to correct and/or in penalties.



Severity

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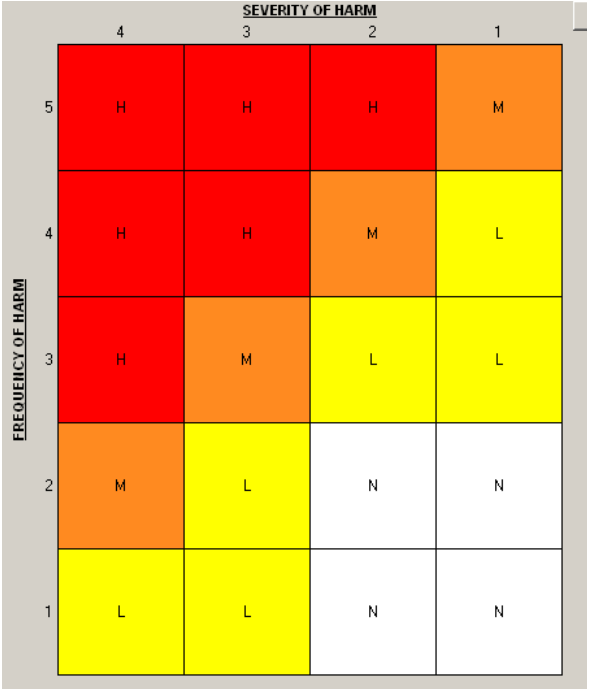

N = Negligible. No additional Controls are to be added.

L = Low. No additional Controls are to be added.

M = Moderate. The Moderate Hazards must be discussed by the JHA Create Team members. The JHA Create Team members will investigate the hazard risk further and decide if additional Controls are to be added, or if no further Controls need to be implemented.

H = High. When a High Hazard situation is determined in the Hazard Risk Matrix, Lincoln Electric mandates that additional Controls be implemented to reduce the Hazard Risk to a Moderate, or lower, result. Refer to Controls (see above definition of terms section) for additional information about reducing the Hazard Risk.

The JHA Create Teams shall not submit any JHA's with High Hazards for Managerial Review. High Hazards shall have been reduced to a Moderate, or lower, before such a submission may take place.

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Training

LINCOLN ELECTRIC THE WELDING EXPERTS

JHA 4000 Cleveland Operations Universal Hazards

Moving Equipment

Hazards, Risks and Risk Reductions Involving You, your Co-workers, the Facilities and the Environment								
Hazards	Risks When Reduction Procedures and/or Protections ARE NOT Used			Risk Reduction Procedures and/or Protections	Remaining Risks Even When Reduction Procedures and/or Protections ARE Used		
	Severity	Frequency	Risk		Severity	Frequency	Risk
3. Hit by moving equipment (lift trucks, motorized carts, scale cars, trucks and trains, etc.)	Moderate	Likely	Moderate	1. Always look both ways when entering and crossing an aisle way or roadway. 2. Ensure vehicle(s) has completely passed by you prior to entering aisle ways. 3. Do not operate moving equipment or machinery without proper training.	Moderate	Low	Negligible

Stay inside of walkways

Moving industrial equipment have also been fitted with noise generators and strobe lights.

HOME EXIT LINK TO JHA BACK NEXT

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Summary of Hints

- Before you start, decide what you will do with the JHAs.
- Do the up-front work on forms, risk matrix, guidance documents, management support before you write the 1st JHA. Write, tweak, firm up the process.
- Do the extra work to have your JHA process help you comply with various OSHA regulations.
- Look at ergonomic hazards during the analysis.
- Look at the abnormal or non-routine parts of the job.
- Consider covering environmental hazards in your JHAs.

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Summary of Hints

- Prioritize your jobs / tasks, so you can focus on the most “risky” ones first.
- Get the workers on your teams.
- Don’t stop in the middle of the process. Forge ahead.

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