Worksite Analysis Techniques & Tools

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Why Analyze The Workplace?

What Is Worksite Analysis?

Worksite Analysis *is a* ***combination*** *of* ***systematic actions*** *to provide you with the* ***information*** *you need to* ***recognize and understand*** *the* ***hazards and potential hazards*** *of your workplace.*

Analysis Techniques

- PPE Assessments
- Job Hazard / Safety Analysis
- Risk Reduction Methods
- Comprehensive hazard surveys
- Hazard analysis of changes in the workplace
- Regular site safety and health inspections
- Employee reports of hazards
- Accident /incident investigations.
- Injury and illness trend analysis

- **Severity** – Is an accident likely to be serious in nature?
- **Frequency /Probability** – How likely? Could this happen on a daily basis or once in several years?
- **Type of injury or illness** –What type of injury would an employee sustain?
- **Extent of use** – Are multiple machines in constant use or is only one machine in occasional use?
- **Maintenance and repair** – Are maintenance and repair performed on a regular basis or done when needed?
- **Training** – How much experience/training is required to run the machine? Is a new worker with little training likely to be assigned to this machine or is extensive experience/formal training required?
- **Government regulations** – Is there a OSHA standard that applies?

Analysis Criteria

PPE Assessment Forms

JHS/JSA Forms

Risk Reduction Matrices

Analysis Tools

PERSONAL PROTECTIVE EQUIPMENT
HAZARD ASSESSMENT

Company Name: _____Date of Assessment:_____

Company Address: _____

Workplace Evaluated: _____

Name of Person Completing Assessment: _____

JOB CLASSIFICATION/ WORKSTATION	HAZARD SOURCE/TYPE	BODY PART AFFECTED	PPE REQUIRED YES/NO	TYPE OF PPE REQUIRED

PPE Hazard Assessment Certification Form

Attachment A

Date:

Job / Task:

Hazard Type	No Exposure	Hazard Level			Engineering Controls	Workplace Controls	PPE Required
		High	Moderate	Low			
Impact							
Compression							
Penetration							
Chemical							
Heat							
Dust							
Noise							
Light / Radiation							

Person Completing and Certifying:

Notes:

Basic Steps

1. Select the job
2. Break the job into successive steps
    1. No more than 15 – do another JSA
3. Identify existing & potential hazards for each step
4. Develop ways to eliminate hazards or exposure to the hazards

Benefits

- Simple way to learn more about jobs
- Proactive - demonstrates support of safety
- Creates safer conditions & reduces incidents
- Establishes standards, practices, training
- Provides a basis for incident analysis
- Identifies critical practices for observation
- Great tool for employee involvement

JSA – Steps & Benefits

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Attachment A - Job Hazard Analysis for Personal Protective Equipment (PPE) Assessment

Job/Task: _____

Job/Task Step	Hazard Type	Hazard Source	Body Parts At Risk	Severity	Probability		Control Method[1]

(1) Note: Engineering (E), work practice, and/or administrative (A) hazard controls such as guarding must be used, if feasible, before requiring employees to use personal protective equipment(PPE).

Certification of Assessment

*Name of work place: _____ *Address _____

*Assessment Conducted By: _____ Title: _____ *Date(s) of Assessment _____

- A process that involves a study to:
  - Analyze jobs
  - Identify hazards and existing controls
  - Determine the level of risk
  - Identify controls to reduce risk
  - Measure the amount of risk reduction

Residual Risk Reduction

Liberty Mutual System

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- An inherent feature of systems; a quality that always exists to some degree
  - Is definable in terms of three factors (Frequency, Likelihood, & Severity)
  - Once it is defined, it can be quantified
  - The quantity of risk can be changed by changing these factors

Some Facts About Risk

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- Frequency (Exposure Opportunity)
  - How often the exposure exists
- Likelihood (Chance of Occurrence)
- Severity (Degree of Harm)
  - Worst *Plausible* scenario

The Risk "Factors"

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Rating	Frequency	Likelihood	Severity
1	< once per shift or day	Impossible	First Aid
2	> once per shift or day	Unlikely	Medical Treatment
3	> once per hour	Possible	Lost Time / Full Recovery
4	> once per five minutes	Probable	Some Permanent Impairment
5	At all times	Multiple	Major Permanent Impairment or Death

- The quantity of risk can be changed by changing the risk "factors"
  - Eliminating a step
  - Changing how a step is done
  - Implementing new/revised controls

Risk =
Frequency x Likelihood x Severity 15

R3 Example

Climbing & Working on Production Christmas Trees

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Production Tree Examples

Production Tree Examples

Exposure Example

Exposure Example

R3™ Baseline

Facility: Superior Wireline Division						Exposure: Falls While Working on Production Trees				
System: Production Trees						Date: May, 2009				
Task: Evaluating the task of climbing and working on production trees										
Concern	**Current Controls**	**F**	**L**	**S**	**Risk**	**New Controls**	**F**	**L**	**S**	**Risk**
Employees exposed to falls while either climbing up or down production trees	Orientation, JSEA, Work Boots, Clean Tree, 3 Pt Climbing, Dedicated Climbing Training, Stop Work Authority, Behavior Based Safety	4	3	4	48					
	Risk Index[1]				48	**Risk Index[2]**				

R3™ Worksheet

Facility: Superior Wireline Division						Exposure: Falls While Working on Production Trees				
System: Production Trees						Date: May 2009				
Task: Evaluating the task of climbing and working on production trees										
Concern	**Current Controls**	**F**	**L**	**S**	**Risk**	**New Controls**	**F**	**L**	**S**	**Risk**
Employees exposed to falls while either climbing up or down production trees	Orientation, JSEA, Work Boots, Clean Tree, 3 Pt Climbing, Stop Work Authority, Behavior Based Safety	4	3	4	48	All of the controls in the Baseline Assessment plus Job Specific Fall Protection Procedures	4	2	2	16
	Risk Index[1]				48	**Risk Index[2]**				16

Use of Fall Protection

Production Tree
Residual Risk Reduction

R3 = [(RI1 – RI2)/RI1 X100] = % Reduction

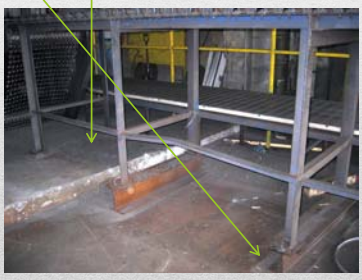
48-16 = 67% Reduction
48x100

Residual Risk Reduction

Safety Concerns	Existing Controls (Engineering, Training, Performance)	F	L	S	Baseline Risk Score
Being struck by pallet coming off rollers at load end	Wood block/ board in place	5	4	4	80
Slip hazard - Bay 3 walk way	5S	5	3	3	45

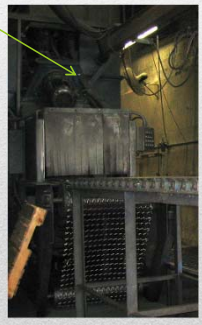
Residual Risk Reduction

Slip hazard - Both sides of shotblaster	5S	5	4	3	60
Rollers not stationary, could be moved/struck by a forklift		5	3	4	60
Different size pallets cause lack of stability on load rollers		5	3	4	60



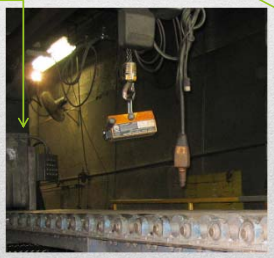
Residual Risk Reduction

Different size pallets cause lack of stability on load rollers		5	3	4	60
Shotblast flying in different directions	PPE, plastic strips covering opening/exit	5	5	2	50
No latch on the shotblast filling station - lid may fall while filling		5	3	2	30



Residual Risk Reduction

Loading the Shotblaster (parts) manually	Training/policy to not lift more than 60#	5	3	4	60
Loading the Shotblaster with a magnet (magnet just goes N/S, no E/W)	Training/policy	5	3	3	45
Trip and fall going up and down the steps (Bay 3 side)		5	3	3	45



Residual Risk Reduction

Unauthorized entry to back side of machine		5	3	3	45
Potential strain loading shot into the machine	Training	5	3	4	60

Residual Risk Reduction

Catwalk/stairs on exit side unstable and has no handrail		5	4	3	60
Spacing on the second set of rollers is too wide (exit side); parts may fall between rollers		5	4	3	60

Residual Risk Reduction

Flipping parts manually		5	3	3	45
Flipping parts with a magnet	Against company policy	5	1	4	20
Trip hazard with the air hose	5S	5	3	3	45
Walkway with forklift traffic - unloading skids - blind areas	Forklift training	5	3	4	60

Residual Risk Reduction

Unused 5S tool boards - one on each side		5	4	5	100
Electrical outlets covered with duct tape	Duct tape	5	2	2	20

Residual Risk Reduction

Dust collector barrel		3	4	4	48

Residual Risk Reduction

ACTIVITY/EVENT: Shot Blasting
TEAM MEMBERS: Clayton Carrier-Facilitator, Emma Reed-Scribe, Josh Griffin, Jacob Hall, Danny Stivers, Larry Walden

Start Date: 4/25/2013
Updated on: 5/28/2013

Safety Concerns	Existing Controls (Engineering, Training, Performance)	F	L	S	Baseline Risk Score
Being struck by pallet coming off rollers at load end	Wood block/ board in place	5	4	4	80
Slip hazard - Bay 3 walk way	5S	5	3	3	45
Slip hazard - Both sides of shotblaster	5S	5	4	3	60
Rollers not stationary, could be moved/struck by a forklift		5	3	4	60
Different size pallets cause lack of stability on load rollers		5	3	4	60
Shotblast flying in different directions	PPE, plastic strips covering opening/exit	5	5	2	50
No latch on the shotblast filling station - lid may fall while filling		5	3	2	30
Expose moving parts/areas	Kill switch	5	3	4	60
Loading the Shotblaster (parts) manually	Training/policy to not lift more than 60#	5	3	4	60
Loading the Shotblaster with a magnet (magnet just goes N/S, no E/W)	Training/policy	5	3	3	45
Trip and fall going up and down the steps (Bay 3 side)		5	3	3	45
Unauthorized entry to back side of machine		5	3	3	45
Potential strain loading shot into the machine	Training	5	3	4	60
Catwalk/stairs on exit side unstable and has no handrail		5	4	3	60
Spacing on the second set of rollers is too wide (exit side); parts may fall between rollers		5	4	3	60
Flipping parts manually		5	3	3	45
Flipping parts with a magnet	Against company policy	5	1	4	20
Trip hazard with the air hose	5S	5	3	3	45
Walkway with forklift traffic - unloading skids - blind areas	Forklift training	5	3	4	60
Unused 5S tool boards - one on each side		5	4	5	100
Electrical outlets covered with duct tape	Duct tape	5	2	2	20
Dust collector barrel		3	4	4	48
				Risk Index =	1158

New Controls (Engineering, Training, Performance)	F	L	S	New Risk Score	Drop from Baseline to New	Baseline % Reduction	Max Cost Estimate	Estimated Hours	Date Complete	Person Responsible

Risk Matrix

	1	2	3	4	5
F	< Once/month	< Once/week	< Once/per shift	>Once/Shift	At or nearly at all times
L	highly unlikely	unlikely	possible	likely	highly likely
S	first aid or no injury	medical treatment	lost time, full recovery	some permanent impairment	major permanent impairment or death

Residual Risk Reduction

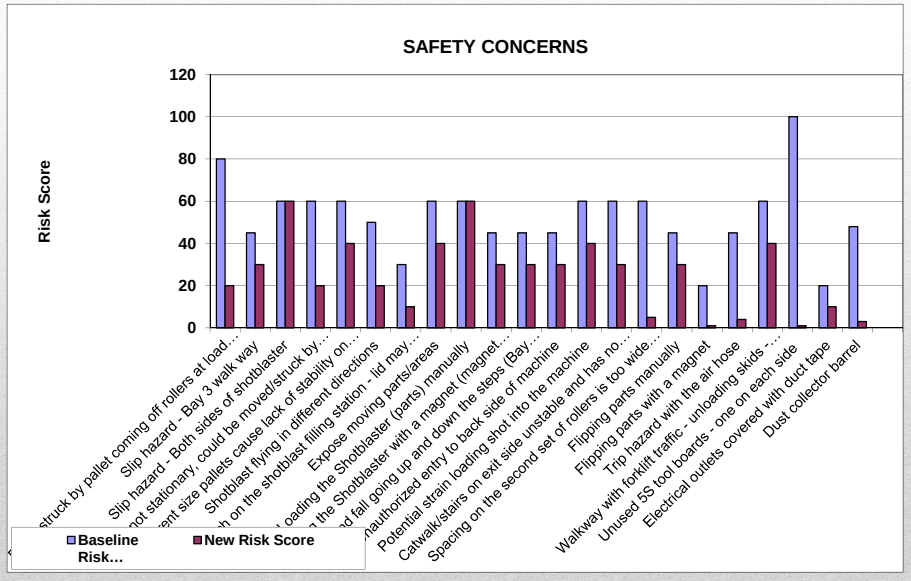
ACTIVITY/EVENT: Shot Blasting
TEAM MEMBERS: Clayton Carrier-Facilitator, Emma Reed-Scribe, Josh Griffin, Jacob Hall, Danny Sivers, Larry Walden

Start Date: 4/25/2013
Updated on: 5/28/2013

Safety Concerns	Existing Controls (Engineering, Training, Performance)	F	L	S	Baseline Risk Score	New Controls (Engineering, Training, Performance)	F	L	S	New Risk Score	Drop from Baseline to New	Baseline % Reduction	Max Cost Estimate	Estimated Hours	Date Complete	Person Responsible
Being struck by pallet coming off rollers at load end	Wood block/ board in place	5	4	4	80	Install stops at the ends of rollers	5	1	4	20	60	75%	$0	0.50		BigFoot
Slip hazard - Bay 3 walk way	5S	5	3	3	45	Install plastic curtains across entrance & exit, overlapping each side; supervisor and cell leader reinforcement	5	2	3	30	15	33%	$1,000	16.00		BigFoot
Slip hazard - Both sides of shotblaster	5S	5	4	3	60	5S - try to keep the areas clean; supervisor and cell leader reinforcement	5	4	3	60	0	0%	$0	0.00		Chad Milburn
Rollers not stationary, could be moved/struck by a forklift		5	3	4	60	Anchor to the ground	5	1	4	20	40	67%	$0	2.00		BigFoot
Different size pallets cause lack of stability on load rollers		5	3	4	60	Aluminum platform	5	2	4	40	20	33%	$50	2.00		Clayton Carrier
Shotblast flying in different directions	PPE, plastic strips covering opening/exit	5	5	2	50	Install a curtain that overlaps the sides	5	2	2	20	30	60%	$50	2.00		BigFoot
No latch on the shotblast filling station - lid may fall while filling		5	3	2	30	Install a latch	5	1	2	10	20	67%	$10	1.00		BigFoot
Expose moving parts/areas	Kill switch	5	3	4	60	Cover up the holes/scrap ex metal to fill in holes	5	2	4	40	20	33%	$150	4.00		BigFoot
Loading the Shotblaster (parts) manually	Training/policy to not lift more than 60#	5	3	4	60	Training	5	3	4	60	0	0%	$0	0.00		Chad Milburn
Loading the Shotblaster with a magnet (magnet just goes N/S, no E/W)	Training/policy	5	3	3	45	Training - job-specific training. Look into a Jib crane.	5	2	3	30	15	33%	$0	0.00		Chad Milburn
Trip and fall going up and down the steps (Bay 3 side)		5	3	3	45	Install handrail, reflective tape, paint	5	2	3	30	15	33%	$50	2.00		BigFoot
Unauthorized entry to back side of machine		5	3	3	45	Install yellow chains; signage "authorized personnel only"	5	2	3	30	15	33%	$25	1.00		BigFoot
Potential strain loading shot into the machine	Training	5	3	4	60	Alternate shot packaging (talk to Judy); see if different containers are available	5	2	4	40	20	33%	$0	0.00		Clayton Carrier Randy Gray
Catwalk/stairs on exit side unstable and has no handrail		5	4	3	60	Completely renovate entire catwalk (extend to reach skid)	5	2	3	30	30	50%	$500	24.00		BigFoot
Spacing on the second set of rollers is too wide (exit side); parts may fall between rollers		5	4	3	60	Place spacers between rollers	5	1	1	5	55	92%	$50	1.00		Clayton Carrier Larry Walden
Flipping parts manually		5	3	3	45	Training	5	2	3	30	15	33%	$0	0.00		Chad Milburn
Flipping parts with a magnet	Against company policy	5	1	4	20	Prohibited - against policy	1	1	1	1	19	95%	$0	0.00		Chad Milburn
Trip hazard with the air hose	5S	5	3	3	45	5S - install a hose roller	1	2	2	4	41	91%	$25	0.25	05/09/13	Emma Reed
Walkway with forklift traffic - unloading skids - blind areas	Forklift training	5	3	4	60	Training; proper warning signage	5	2	4	40	20	33%	$205	1.00		Emma Reed Randy Gray
Unused 5S tool boards - one on each side		5	4	5	100	Remove boards	1	1	1	1	99	99%	$0	0.50		Chad Milburn
Electrical outlets covered with duct tape	Duct tape	5	2	2	20	Replace duct tape with a ground fault plug cover	5	1	2	10	10	50%	$25	0.50		BigFoot
Dust collector barrel		3	4	4	48	Replace with a self-dumping hopper	3	1	1	3	45	94%	$500	2.00		Randy Gray
	Risk Index =				**1158**		**Risk Index =**			**554**			**$2,640**	**59.75**		

Residual Risk Reduction (R3) = 52%

Residual Risk Reduction



Residual Risk Reduction

Shot blaster 30 day action item list (COMPLETED 8/8/13) (GO FOR GOLD)

Action Item	Assigned To	Target Date	Comments	25%	50%	75%	100% done	Completion Date
Install a stop at the end of the rollers.	Bigfoot	7/1/2013	Done				X	6/11/2013
Install plastic curtains across he entrance and exit, overlapping each side.	Bigfoot	7/1/2013	WO# 56500 entered 6/6/13 Project delayed by Jim Guy on 6/12/13					
Anchor the rollers on the entrance side to the ground.	Bigfoot	7/1/2013	Done				X	6/12/2013
Replace existing curtains in the machine.	Bigfoot	7/1/2013	Done				X	6/12/2013
Install a latch on the shot filling station to hold the lid open.	Bigfoot	7/1/2013	Done				X	6/12/2013
Completely renovate the catwalk on the exit side, extend it to reach skids.	Bigfoot	7/12/2013	Done				X	7/11/2013
Cover up exposed areas in the machine.	Bigfoot	7/1/2013	Done				X	6/28/2013
Replace the duct tape over electrical outlets and replace with ground fault plug cover (used silicone covering).	Bigfoot	7/12/2013	Done				X	8/7/2013
Install Handrail, reflective tape and paint on the steps.	Bigfoot	7/1/2013	Done				X	6/19/2013
Close off the back of the machine with a yellow chain and signage.	Bigfoot	7/1/2013	Done				X	6/19/2013
Have an aluminum platform built for the rollers (to set skids on, Larry Walden print).	Clayton Carrier	7/1/2013	Done				X	6/28/2013
Place spacers between the rollers (Larry Walden print).	Clayton Carrier/ Larry Walden	7/12/2013	Done				X	6/29/2013
Alternate shot packaging, order in #50 bags.	Clayton Carrier/ Randy Gray	7/1/2013	Done				X	6/17/2013
Place proper warning signage around the machine and warehouse.	Emma Reed/ Randy Gray	7/12/2013	Done				X	6/29/2013
Replace the dust collector barrel with a self dumping hopper.	Randy Gray	7/12/2013	Done				X	8/7/2013
Remove the yellow tool boards from inside the shotblaster.	Chad Milburn	7/1/2013	Done				X	6/26/2013
Proper training on running shotblaster, flipping parts, loading, properly 5S, (posted SOP).	Chad Milburn Randy Gray	7/12/2013	Done				X	6/29/2013

Results

Out feed side catwalk replaced

In feed catwalk replaced

Results

Shot is now bought in 40# bags replacing the 55 gallon drums

The hopper lid has a latch for operator safety while filling

Results

Shot escaping the machine has been stopped by replacing the curtain and adding the cover plate.

The wide spacing on the out feed rollers has been covered

Results

The rollers have a stop, using the formed plate skids of all sizes can be handled safely.

Results

Electrical boxes properly covered. The outlets were eliminated as steel shot created an electrical hazard

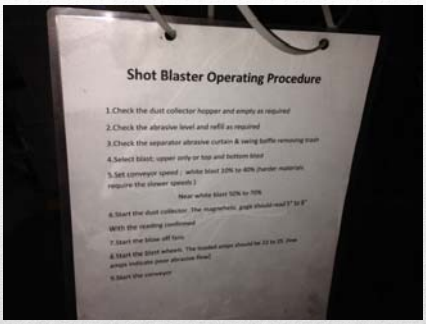
In feed conveyor anchored and welded

Results

Entry to the back of the blaster is restricted

The drum was replaced with a dump hopper. Waste from the dust collector is now easily handled

Results



Operating procedures are posted and followed in training

Clean walking working surfaces

- Can provide a means for assessing systems
- Can get many people closest to the risk in the system involved in the risk reduction
- Illustrates how interventions affect risk
- Provides both upstream and downstream measures for safety efforts
- Can motivate action to reduce risk from hazards in systems
- Meet OSHA requirements and guidelines

Benefits of a Risk Reduction Tool 45

QUESTIONS?