



Crowded Work Area and Bad Stock Caused Knee Injury

Purpose

To share “lessons learned” gained from incident investigations through a small group discussion method format.

To understand “lessons learned” through a Systems of Safety viewpoint.



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Lessons Learned

Volume 10, Issue 23

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Background Information

Before beginning this Lessons Learned, please review this and the next page which contain information that will introduce the concepts of Lessons Learned and Systems of Safety.

Creating a safe and healthy workplace requires a never ending search for hazards that sometimes are not obvious to us. These hazards exist in every workplace and can be found by using various methods. Lessons Learned are just as the name suggests: learning from incidents to prevent the same or similar incidents from happening again.

Systems Are Not Created Equal: Not equal in protection and not equal in prevention.

Using our Systems Focus to uncover system flaws or root causes is only one part of controlling hazards. We also need to look at the systems involved to decide on the best way to deal with the problem. The most effective way to control a hazard is close to its source. The least effective is usually at the level of the person being exposed. The system of safety in which the flaw is identified is not necessarily the system in which you would attempt to correct the flaw.



Major Safety System	Design & Engineering	Maintenance & Inspection	Mitigation Devices	Warning Devices	Training & Procedures	Personal Protective Factors
Level of Prevention	Highest—the first line of defense	Middle—the second line of defense			Lowest—the last line of defense	
Effectiveness	Most Effective	←————→				Least Effective
Goal	To eliminate hazards	To further minimize and control hazards				To protect when higher level systems fail
EXAMPLES OF SAFETY SUB-SYSTEMS**	Technical	Inspection and Testing	Enclosures, Barriers Dikes and Containment	Monitors	Operating Manuals and Procedures	Personal Decision-making and Actions HF
	Design and Engineering of Equipment, Processes and Software	Maintenance	Relief and Check Valves	Process Alarms	Process Safety Information	Personal Protective Equipment and Devices HF
	Management of Change (MOC)**	Quality Control	Shutdown and Isolation Devices	Facility Alarms	Process, Job and Other Types of Hazard Assessment and Analysis	Stop Work Authority
	Chemical Selection and Substitution	Turnarounds and Overhauls	Fire and Chemical Suppression Devices	Community Alarms	Permit Programs	
	Safe Siting	Mechanical Integrity	Machine Guarding	Emergency Notification Systems	Emergency Preparedness and Response Training	
	Work Environment HF				Refresher Training	
	Organizational (must address a root cause)				Information Resources	
	Staffing HF				Communications	
	Skills and Qualifications HF				Investigations and Lessons Learned	
	Management of Personnel Change (MOPC)				Maintenance Procedures	
	Work Organization and Scheduling HF				Pre-Startup Safety Review	
	Work Load					
	Allocation of Resources					
	Buddy System					
	Codes, Standards, and Policies**					

HF - Indicates that this subsystem is often included in a category called Human Factors.

* There may be additional subsystems that are not included in this chart. Also, in the workplace many subsystems are interrelated. It may not always be clear that an issue belongs to one subsystem rather than another.

** The Codes, Standards and Policies and Management of Change subsystems listed here are related to Design and Engineering. These subsystems may also be relevant to other systems; for example, Mitigation Devices. When these subsystems relate to systems other than Design and Engineering, they should be considered as part of those other systems, not Design and Engineering.

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Lessons Learned Statement

When we talk about proper housekeeping in our work areas, most of us think about scrap lying around, dirty areas, tools not put away, air hoses out of place, etc. But, more importantly, we need to look at the set up of the area and the condition of the equipment, not just the dirt and mess.

In the **Design and Engineering System of Safety**, safe siting is very important. The storage of printing dies and the position of a step-up are a big part of the incident we will discuss here. The poor design of the area and improper bracing for stairs left every worker vulnerable to dangerous conditions.

The **Design and Engineering System of Safety** also covers how we organize our work. Pitting one department against another, whether about production or waste, is not conducive to production or safety. Manufacturing controls are needed, but should not compromise the safety of the workers.

Scrap metal was used to brace stairs and the condition of the equipment in the area was also poor. A metal blower system housing had been dropped and bent out of shape and never repaired. Working within the **Maintenance and Inspection System of Safety** by using the proper material to anchor the stairs and repairing the metal blower housing would have decreased the likelihood of the worker getting injured.

Providing workers with a procedure for handling warped stock and the proper training would be working within the **Training and Procedures System of Safety**. This would have decreased the probability of the worker being injured.

Discussion

A worker was operating a flatbed, die-cut printing machine in a corrugated box factory. Things were going fine until he noticed that the auto-feeder on the machine was about to feed some severely warped stock into the machine. This warped stock would have caused the machine to jam up, causing all kinds of problems:

- The paper would stick to the printing die and would cause a 15-minute cleanup.
- Some of the knives would have paper stuck to them and would have to be cleaned out, taking considerable time depending on the amount of paper.
- The timing would have to be reset and everything checked and double checked to make sure the product remained in spec after the jam-up; and
- The foreman would be hanging over the operator's shoulder hollering about production losses.

In order to avoid this hassle, the operator turned to run up to the feeder to shut it down before the bad paper got to the feed hopper. When he turned, he tripped on a brace for a stair that is used to step up and see inside the machine. While he was trying to save himself from falling, his knee hit the housing of the blower system (scrap removal system). The blower housing had recently been removed to perform maintenance on the system and had been dropped while being reinstalled. The metal housing got all bent out of shape and did not fit properly when it was bolted back together. This resulted in very sharp edges that were spread apart making two knife-like edges.

continued

Discussion *(continued)*

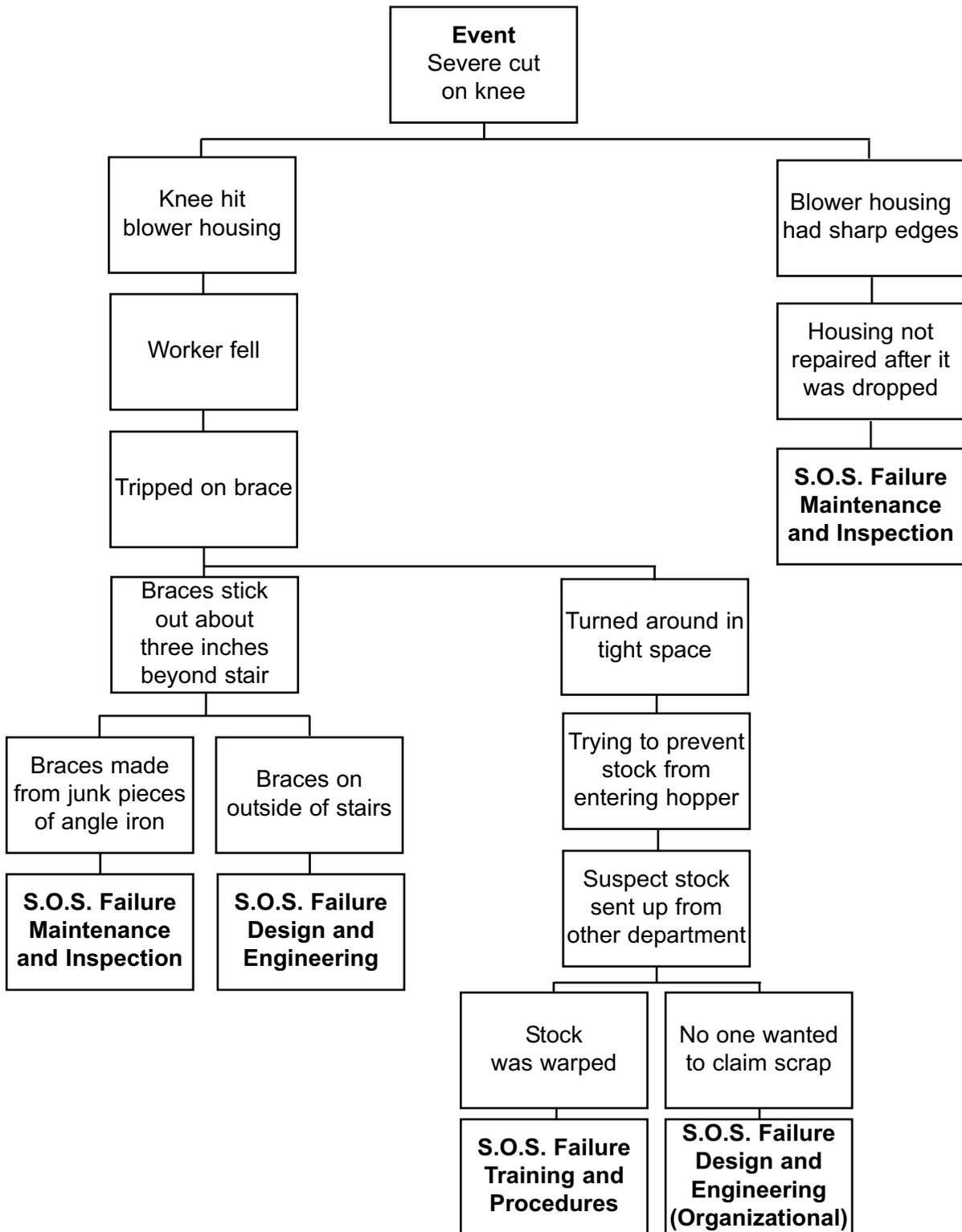
When the operator's knee hit those edges, he fell on the ground and started bleeding profusely. He was taken to the hospital and received 27 stitches. When the incident was being investigated, the first reaction was that the operator should not have been running. But, further investigation revealed that he had only moved about two feet and never got the chance to run. It was also noted that the space he was trying to hurry through was only about two and a half feet wide and the braces on the steps stuck out about three inches into the walk area. The braces for the stairs (to hold stairs in place) were just junk pieces of angle iron bolted to a grate to keep the stairs from sliding. Also, there were several printing dies hanging from a hook right next to the walkway area, taking up even more of the space.

None of these items would have been an issue at this time if the stock that was sent to his machine had not had the bad material in the load. The material should have been scrapped where it was produced, not sent to the finishing machines. The employer had recently started tracking all scrap and the supervisors were chastised if the amount of scrap was excessive. This started a scrap war, where no one wanted to claim they were the source of excess scrap. Instead of having it be charged to the original department, it kept getting pushed on until the final operation.

After the investigation was complete, every blower housing on each machine was inspected and they all had the same problems: Bent out shape, bolts missing and generally in disrepair. Every one of them had the potential to cause a severe injury.

Analysis

The **Logic Tree** is a pictorial representation of a logical process that maps an incident from its occurrence, “the event,” to facts of the incident and the incident’s root causes.



Recommended Actions

1. Replace the blower housing or repair current one to fit properly.
2. Make braces for the stairs that hook underneath the stair, not on the outside.
3. Store printing dies away from walkway.
4. Quit the scrap counting and punishment.
5. Demand that parts are in good working order before maintenance workers leave the area of a repair.
6. If something gets broken, bent, is missing bolts, etc., repair it immediately
7. If the bent or broken equipment cannot be repaired or replaced immediately, at the very least, mitigate the danger with padding, barricades or anything it takes to prevent contact with workers.
8. Provide training on how to handle warped stock.

Education Exercise

Working in your groups and using the Lessons Learned Statement, Discussion, Analysis and Recommended Actions, answer the two questions below. Your facilitator will give each group an opportunity to share answers with the large group.

1. Give examples of ways to apply the Lessons Learned Statement at your workplace.

2. Of the examples you generated from Question 1, which will you pursue in your workplace? (**Note:** When we say something you may pursue, we mean a joint labor-management activity or a union activity rather than an activity carried out by you as an individual.)

Trainer's Lessons Learned Success Inventory

Following a Lessons Learned (LL) session, **the trainer who led the LL** should complete this form. This information will: 1) Help you reflect on the successes and challenges of the session; 2) Help USW with new curriculum development; and 3) Help USW as a whole better understand how the LL Program is supporting their workers.

By reviewing LL from different sites or from other areas of their workplaces, workers are able to analyze the information and apply these lessons to their own workplaces in order to make their workplaces healthier and safer.

1. Site name (if there are participants from more than one site, please list all).

2. Date of LL training _____

3. LL number used in today's Training _____

4. Your name _____

5. **Summary of Education Question 1:** Please summarize participants' examples of ways to apply this LL Statement to their workplace.

- 6. Summary of Education Question 2:** Please summarize actions or recommendations participants discussed pursuing at their workplace(s).

Thank you for completing this form.

EVALUATION

Lessons Learned: Crowded Work Area and Bad Stock Caused Knee Injury

Please answer the two questions below:

1. How important is this lessons learned to you and your workplace? (Circle one.) Rate on a scale of 1 to 5, with 5 being the most important.

1	2	3	4	5
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2. What suggestions would you make to improve this Lessons Learned?

End of Training Trainer’s Instructions

Please complete the information below.

Trainer’s Name _____
(Please Print)

Date of training: _____

No. of Participants: Total _____ Hourly _____ Management _____

Location of Training: _____

USW Local # _____

Send:

1. This page;
2. The Education Exercise (page 9);
3. The Trainer’s LL Success Inventory form (pages 10 and 11);
4. The evaluation for each participant (page 12); and
5. The Sign-in sheet (page 14) to:

<p>If you are a TOP Site (excluding DOE TOP Sites)</p>	<p>Send to: Steve Cable 2915 Gradient Drive St. Louis, MO 63125</p>
<p>All other sites (including DOE TOP Sites)</p>	<p>Send to: Doug Stephens United Steelworkers 3340 Perimeter Hill Drive Nashville, TN 37211</p>

Thank you for facilitating the sharing of this
Lesson Learned with your coworkers.



SIGN-IN SHEET *(Please print clearly.)*

Class Title: _____ Class Completion Date: _____

Location (City, State)/Facility: _____

Grant Program: _____ Dist. & LU #: _____

Instructors: 1) _____ 2) _____

3) _____ 4) _____ 5) _____

Name (print first and last)

Check one:

		Hourly	Management
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
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14			