Repetitive Motion Causes Shoulder 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 09, Issue 27
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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.
<table>
<thead>
<tr>
<th>Major Safety System</th>
<th>Design &amp; Engineering</th>
<th>Maintenance &amp; Inspection</th>
<th>Mitigation Devices</th>
<th>Warning Devices</th>
<th>Training &amp; Procedures</th>
<th>Personal Protective Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level of Prevention</td>
<td>Highest—the first line of defense</td>
<td>Middle—the second line of defense</td>
<td>Highest—the first line of defense</td>
<td>Middle—the second line of defense</td>
<td>Lowest—the last line of defense</td>
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</tr>
<tr>
<td>Effectiveness</td>
<td>Most Effective</td>
<td>To eliminate hazards</td>
<td>To further minimize and control hazards</td>
<td>To protect when higher level systems fail</td>
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</table>

**EXAMPLES OF SAFETY SUB-SYSTEMS**

- **Technical**
  - Design and Engineering of Equipment, Processes and Software
  - Management of Change (MOC)**
  - Chemical Selection and Substitution
  - Safe Siting
  - Work Environment **HF**
  - Organizational (must address a root cause)
    - Staffing **HF**
    - Skills and Qualifications **HF**
    - Management of Personnel Change (MOPC)
    - Work Organization and Scheduling **HF**
    - Work Load
    - Allocation of Resources
    - Buddy System
    - Codes, Standards, and Policies**

- **Inspection and Testing**
  - Maintenance
  - Quality Control
  - Turnarounds and Overhauls
  - Mechanical Integrity

- **Enclosures, Barriers, Dikes and Containment**
  - Relief and Check Valves
  - Shutdown and Isolation Devices
  - Fire and Chemical Suppression Devices
  - Machine Guarding

- **Monitors**
  - Process Alarms
  - Facility Alarms
  - Community Alarms
  - Emergency Notification Systems

- **Operating Manuals and Procedures**
  - Process Safety Information
  - Process, Job and Other Types of Hazard Assessment and Analysis
  - Permit Programs
  - Emergency Preparedness and Response Training
  - Refresher Training
  - Information Resources
  - Communications
  - Investigations and Lessons Learned
  - Maintenance Procedures
  - Pre-Startup Safety Review

**Higher Level Systems**

- Personal Decision-making and Actions** HF**
- Personal Protective Equipment and Devices** HF**
- Stop Work Authority

**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:

The lack of equipment modifications to automatically remove scrap from a paper machine, improper staffing and lack of a better way to remove wet scrap paper from under a paper machine, led to a worker being injured. *Systems of Safety* are utilized to provide prevention for this type of incident.

The protection provided by installing automatic systems to remove broke paper from a paper machine and transporting it to the pulper; a mechanical way of removing wet scrap paper from the floor and dumping it; and improvements in workload staffing are examples of using a well-defined *Design and Engineering System of Safety* approach that would prevent these types of incidents.

Despite the fact that an automatic system to remove broke paper had been installed on other paper machines in the workplace, no action had been taken within the *Design and Engineering System of Safety* to modify this machine. This system would have identified the need for workload adjustments and a mechanical means to remove and dump the wet paper that had accumulated on the basement floor.
Discussion:

A worker had been working all morning in the basement of the No. 8 paper machine hauling broke (loose paper) to the dry-end pulper. The worker then foamed (used cleaning chemicals) the ramp in the basement of the No. 3 and No. 4 paper machines. The worker brushed the cleaning chemicals on the floor and then rinsed away the chemicals with water. After these tasks were completed, the worker went to lunch. After lunch, the worker continued hauling broke in the basement of the No. 8 paper machine. The worker was also hauling wet broke, which is picked up by hand, put into a cart and emptied by hand into the pulper, located on a ramp.

Not long after these tasks, the worker started to feel a sharp pain under the left shoulder blade. The worker went to the Medical Department for evaluation and treatment.

Unlike other machines, the No. 8 paper machine does not have a Size Press Pulper to automatically feed broke back into the pulper.
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.

Event
Worker felt pain under left shoulder blade

Repetitive motion

Pulling scrap paper from under the No. 8 paper machine
Taking wet scrap paper out of cart to put into pulper

Sheet breaks
No auto pulp return
Wet paper in hand cart
Only way to put wet paper into pulper is to lift out of cart by hand

No S.O.S. Failure
S.O.S. Failure Design and Engineering
Loaded wet scrap paper from floor
S.O.S. Failure Design and Engineering

No S.O.S. Failure
Recommended Actions

1. Divide this workload among more workers.

2. Install a Size Press Pulper on the No. 8 machine.

3. Provide a mechanical cart dumper.
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.

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

Thank you for completing this form.
Lessons Learned Repetitive Motion Causes Shoulder 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 |

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 8);
3. The Trainer’s LL Success Inventory form (pages 9 and 10);
4. The evaluation for each participant (page 11); and
5. The Sign-in sheet (page 13) to:

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

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