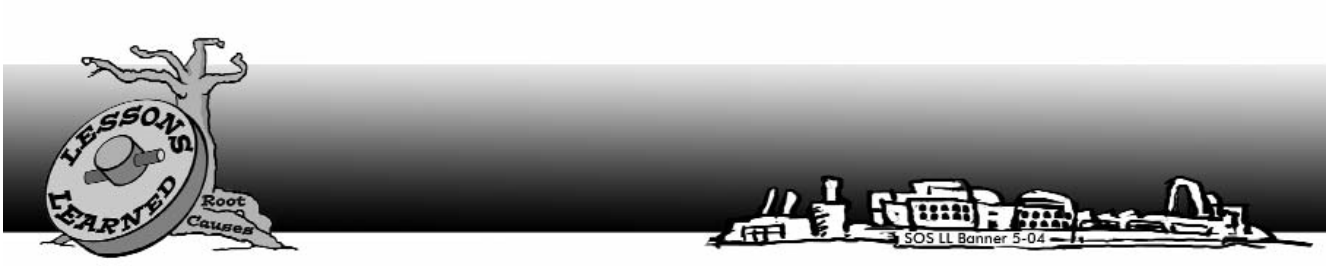

Changing Light Bulb Causes Broken Thumb

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.

TONY MAZZOCCHI CENTER
FOR HEALTH, SAFETY AND ENVIRONMENTAL EDUCATION
A PROJECT OF THE UNITED STEELWORKERS AND THE LABOR INSTITUTE

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Lessons Learned

Volume 10, Issue 34

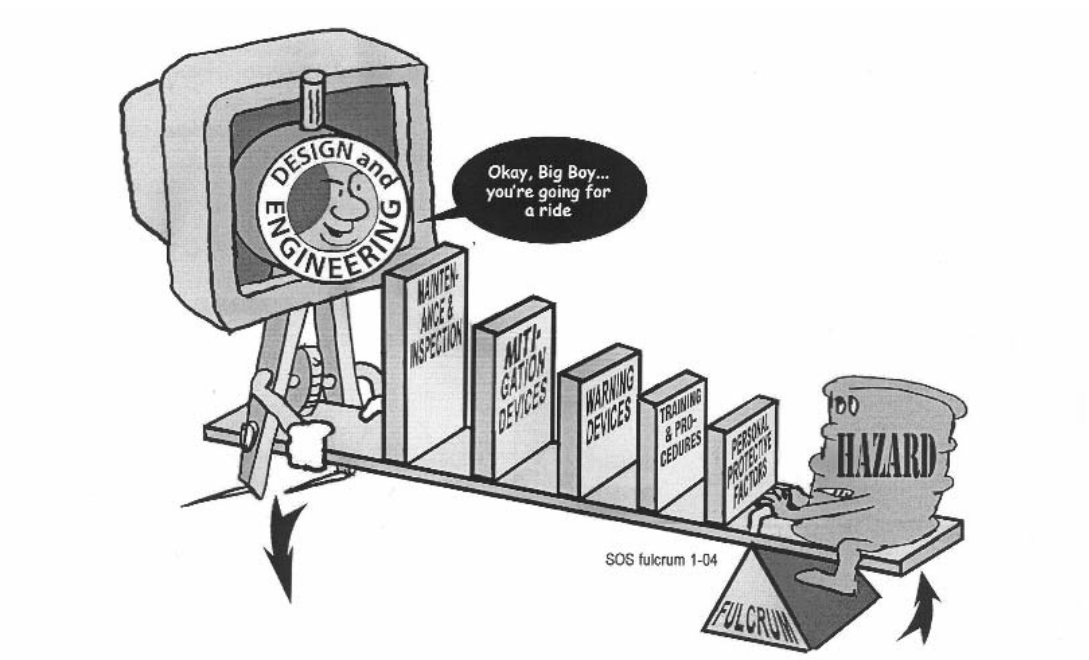
Background Information

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** 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	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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Title: Changing Light Bulb Causes Broken Thumb

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Lessons Learned Statement

An injury in the workplace often results when two or more events combine to create an unsafe condition. An outdated design, lack of training, short staffing and failure of the maintenance program all came together and resulted in a worker's broken thumb. Utilization of ***Systems of Safety*** will afford protection to workers and prevent injuries.

The protection provided by a proven, updated design and the use of a buddy system would assure worker safety and provide a well-defined **Design and Engineering** ***System of Safety*** approach. Failing to replace the older, heavier, glass light covers with the newer, lighter, plastic covers and the lack of a buddy system eliminates the protection afforded by this ***System of Safety***.

Lubricating the light cover latches whenever light bulbs are changed is taking action within the **Maintenance and Inspection** ***System of Safety*** to ensure the light cover latches do not corrode.

The training for workers who change fluorescent light bulbs should include recognizing the difference between the older glass and the newer, plastic light fixtures in the workplace This is applying the **Training and Procedures** ***System of Safety***. Assuming that workers have the knowledge to accomplish a job safely is discarding the protection afforded by this ***System of Safety***.

Discussion

A worker was changing fluorescent light bulbs in an office in an old part of the workplace. He was not aware that the covers over the fluorescent lights were opaque glass and much heaver than the newer, plastic lens covers. The glass and the plastic covers looked the same.

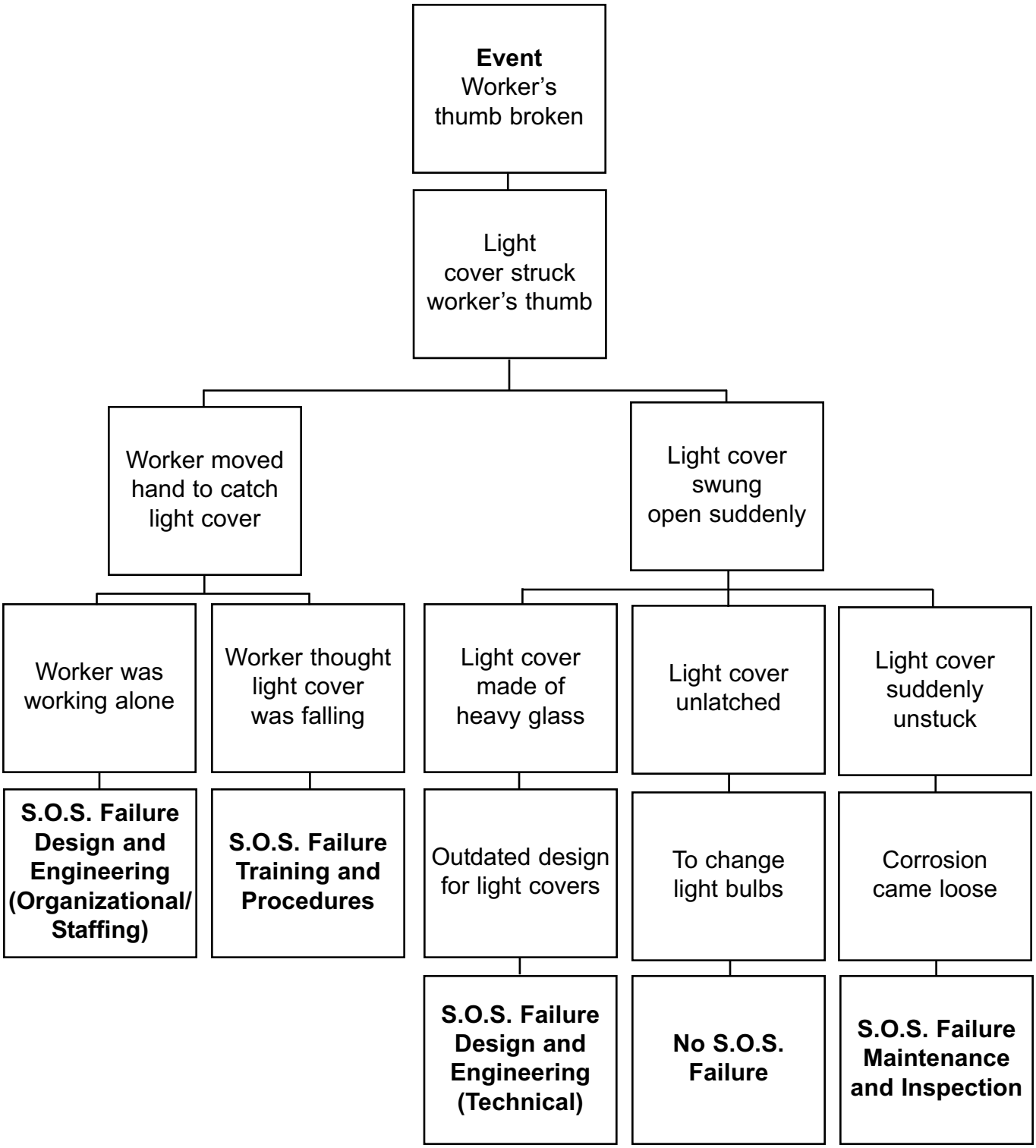
To access the bulbs, the worker must release two latches that permit the cover to swing down and away from the bulbs. The worker released the first latch; then as he released the second latch, the cover rapidly began rotating down on its hinges located on the other side of the cover. The worker, thinking the cover was falling, reacted by moving his left hand up quickly to catch it. This quick movement caused him to strike his thumb on the dropping cover. He reported to the onsite medical facility where he was diagnosed with a broken thumb.

The investigation revealed the following facts:

- The worker was working alone.
- This was the first time the worker had changed bulbs in the area. The worker was working from the second step of a six-foot stepladder.
- The worker had one hand on, or near, the ladder as he unlatched the light cover.
- The latches often stick and do not release the cover due to corrosion. This causes the cover to hang up sometimes after both latches have been released and the glass covers can suddenly swing open.
- Most light covers in this area have a heavy glass lens and not the newer, lighter, plastic lens.
- There is no formal training for workers to change fluorescent bulbs; this task is learned as it is passed from one worker to the next.

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. Train and brief all workers who change fluorescent light bulbs, addressing the different fixtures onsite and the safe handling of bulbs.
2. Utilize two workers whenever a stepladder is used.
3. Replace the older, heavier, glass covers with the new, lighter, glass covers.
4. Evaluate if applying a lubricant to the latches before releasing latches will aid in releasing corroded light covers.
5. After changing light bulbs, lubricate latches before closing them.

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.

EVALUATION

Lessons Learned: Changing Light Bulb Causes Broken Thumb

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:

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

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

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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			
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8			
9			
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11			
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