



Employee Eye Injury (Corneal Abrasion)

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.



This material was produced by the Labor Institute and the United Steelworkers International Union under grant number 46DO-HT11 Susan Harwood Training Grant Program, for the Occupational Safety and Health Administration, U.S. Department of Labor. It does not necessarily reflect the views or policies of the U.S. Department of Labor, nor does mention of trade names, commercial product or organizations imply endorsement by the U. S. Government.

Lessons Learned

Volume 07, Issue 31

© 2007 The Labor Institute

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 sub-system 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 sub-systems listed here are related to Design and Engineering. These subsystems may also be relevant to other systems; for example, Mitigation Devices. When these sub-systems relate to systems other than Design and Engineering, they should be considered as part of those other system, not Design and Engineering.

Revised October 2006



Title: Employee Eye Injury (Corneal Abrasion)

Identifier: Volume 07, Issue 31

Date Issued: March 1, 2007

Lessons Learned Statement:

A well defined **Maintenance and Inspection System of Safety** approach provides protection by developing inspection systems that reduce the potential for exposure and injury in the work place. *Systems of Safety* are utilized to provide prevention from this type of incident.

Designing the problem out and designing in safety systems is the best method for protecting employees. A well defined **Design and Engineering System of Safety** approach provides the safest methods for accessing the chutes and silos for clean out, inspection, and repair.

Discussion:

Operators reported a buildup of ash in the main ash trench line located in the basement. This buildup of ash caused drain water from upstairs to build up and leak into the main ash line. This allowed the ash contained in the silo to become wet. At approximately the same time, a fire was discovered in the #2 coal bunker which initiated running coal out of the bunker.

Due to the bunker fire, excess smoke was created in the bunker room. The Fire Department investigated and attempted to mitigate the situation through the application of water throughout the day. At the time, the running of coal out of #2 coal bunker was interrupted while ash was being pulled from the on-line boiler.

The Coal Handler unloading the ash reported that the silo unloader had stopped feeding. Visual inspection confirmed that the silo was still half full of ash. They suspected the chute above the rotary vane on the unloader was plugged. Due to this suspicion, rodding and lancing took place at the cleanout on the north side of the chute at the bottom of the silo. The plate had not been removed at this point.

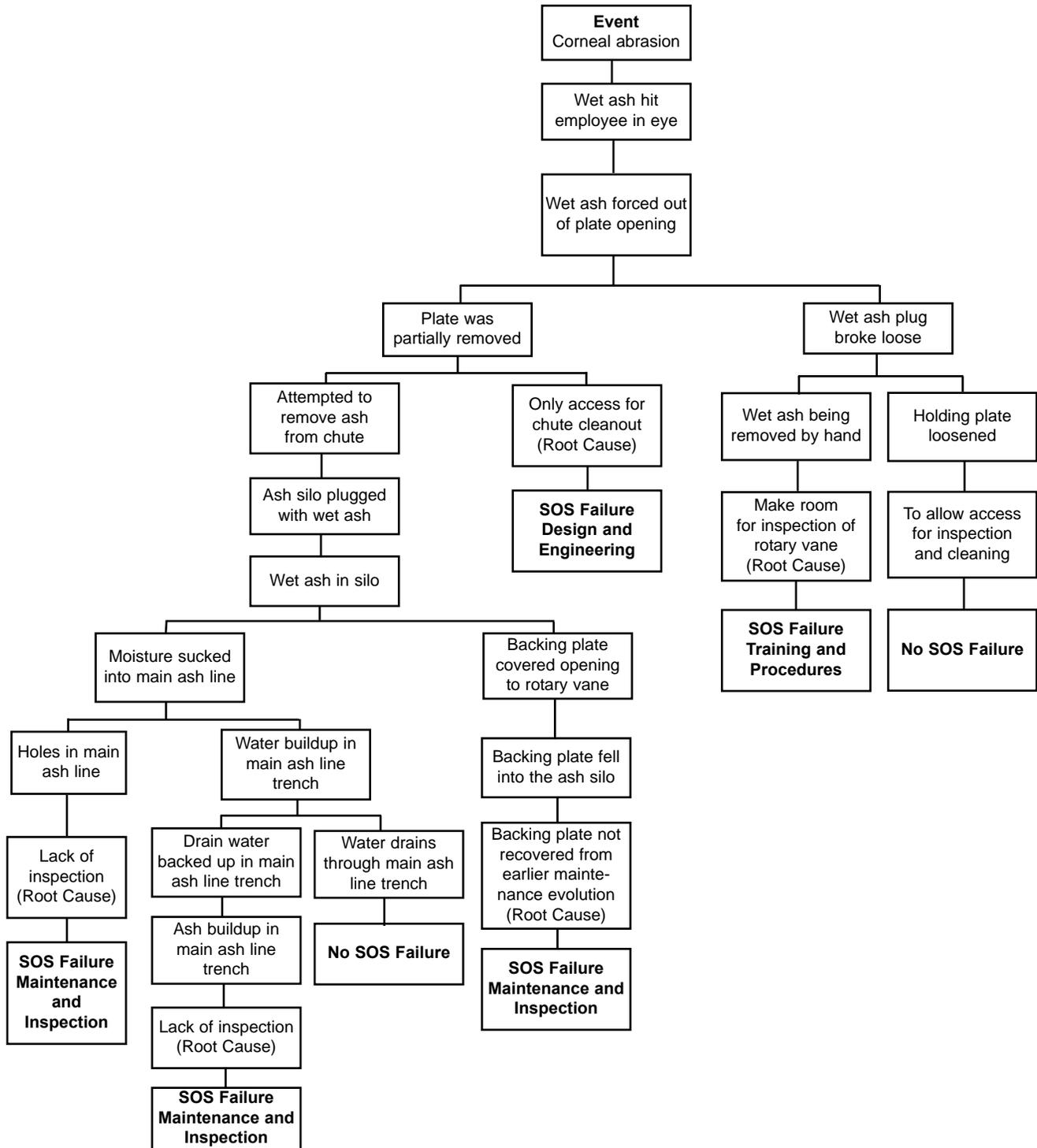
It was reported that an excess of water was used on the midnight shift to extinguish the #2 coal bunker fire. There was still some coal left in the bunker.

The ash silo was nearly full from pulling ash and the air lancing through the cleanout was not working. For inspection purposes, a plate was removed from the cleanout access on the side of the chute. The chute was empty from the bottom of the silo to the rotary vane. A fire hose was inserted into the bottom of the chute via an access plate opening and tied in position. The hose was used to flush a couple of truckloads of ash and water from the silo. Not being able to get ash through the unloader, a similar hose hook-up was used from the top of the silo.

The silo still had ash and water in it and remained plugged. A holding plate was partially removed and bolts removed to allow the bottom of the plate to pull outward. It was discovered that the chute was full of ash and the rotary vane was not removing ash. The employee started removing ash from the chute by hand to inspect the top of the rotary vane. It was at this point that the blockage of ash and water broke loose and spilled out through the opening. This resulted in an eye injury (corneal abrasion) to the employee.

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. Include the inspection of the main ash line trench on daily round sheet to prevent water buildup.
2. Install separate, dedicated piping for drain water which segregates water from ash.
3. Install access ports near bottom of silo to access most likely areas of pluggage to provide for easier cleanout, water wash, air lancing and rodding of the silo.
4. Institute a maintenance system to prevent items from maintenance work falling into the silo.
5. Install an isolation slide gate at the top of the chute to prevent exposure to ash from above to permit safe removal of slide gate and easy access to inspect and clean the chute and rotary vane.
6. Repair slide gate at rotary vane to better isolate the rotary vane for repairs and removal of the rotary vane to clear suspected plugs.
7. Develop procedure for cleaning silo in abnormal situations.

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 ore 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 which actions or recommendations participants discussed pursuing at their workplace(s).

Thank you for completing this form.

EVALUATION

Lessons Learned: Employee Eye Injury (Corneal Abrasion)

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:

Doug Stephens
United Steelworkers International Union
3340 Perimeter Hill Drive
Nashville TN 37211

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

