

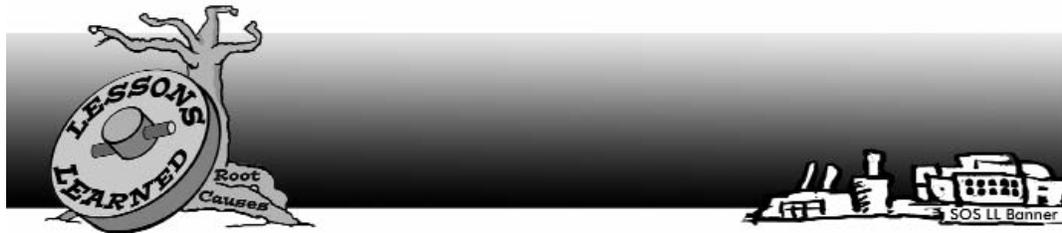


## Chemicals Burn Worker

### 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 08, Issue 37**

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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    |
| <b>EXAMPLES OF SAFETY SUB-SYSTEMS**</b> | <b>Technical</b>  | 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   |  |
|   | <b>Organizational (must address a root cause)</b>           |   |  |                                | 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:**

Foaming with chemicals around equipment can lead to serious injuries to workers if equipment and floor areas are not rinsed thoroughly.

*Systems of Safety* are utilized to provide prevention for this type of incident.

Conditions that existed for the likelihood of an injury:

- Open sleeves that go through the main floor into the basement and are not sealed off. This can allow chemicals to seep and drip into the basement.
- Lack of thoroughly rinsing around open sleeves and floor area after foaming leaves chemical residue.
- Many areas throughout the mill have open sleeves in the main floor where chemicals can seep into the basement.

Procedures for thoroughly rinsing out the chemicals used for foaming would have reduced the probability of an injury and would have been an effective use of the **Maintenance and Inspection System of Safety**. However, the hazard could be mitigated if all open sleeves in the main floor were sealed off. This would have prevented the injury, thereby providing prevention through the proper implementation of the **Mitigation Devices System of Safety**.

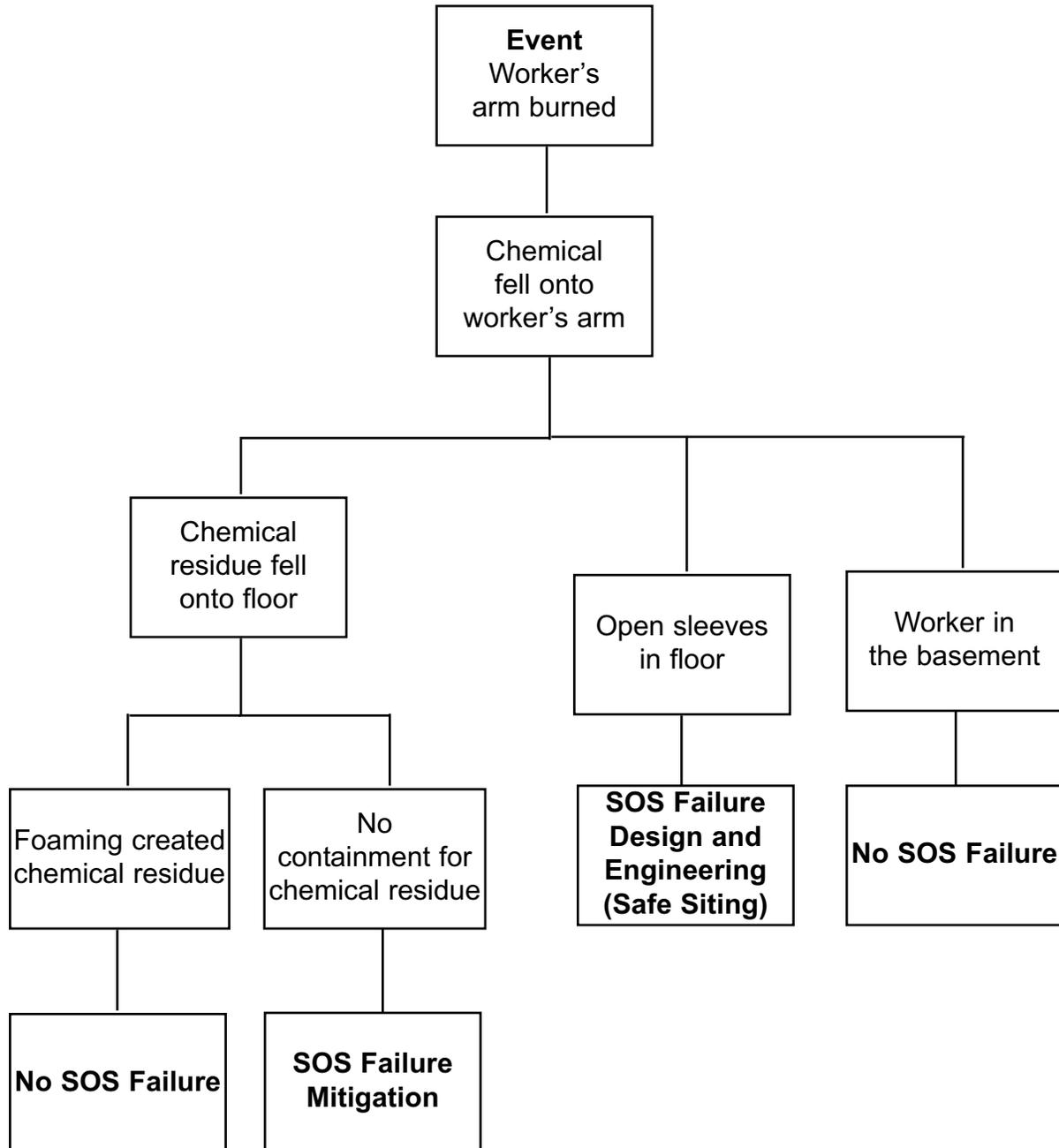
**Discussion:**

An employee was foaming the fourdrinier on A Paper machine. The foaming process includes using a foamer, which has chemicals in it, to clean machine equipment. The chemical used was Chute Clean Machine, which has a MSDS rating of 3.

The following day, in mid-afternoon, an employee was in the process of picking up ladders in the basement of this paper machine when he felt a burning sensation on his left forearm. The employee immediately realized that he had some chemicals on his arm so he rinsed it off with water then went to the lunchroom to wash his arm with soap and water. The employee then proceeded to the Medical Department to report his 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. Fill in all the sleeves that go through the main floor into the basement ceilings with some type of material to prevent liquids from going into the basement.
2. Re-rinse area one more time to assure that all chemical residues are completely removed.
3. Conduct a mill-wide audit to see if there are any other areas that may have similar situations.
4. Communicate to both Sweeper groups to visually inspect the basement for chemical leaks after foaming on the main floors.

## 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.

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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).

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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: Chemicals Burn Worker

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?

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**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:

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

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



