

## Subcontractor Cut Arm When Emptying 55-Gallon Drum

### Purpose

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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**

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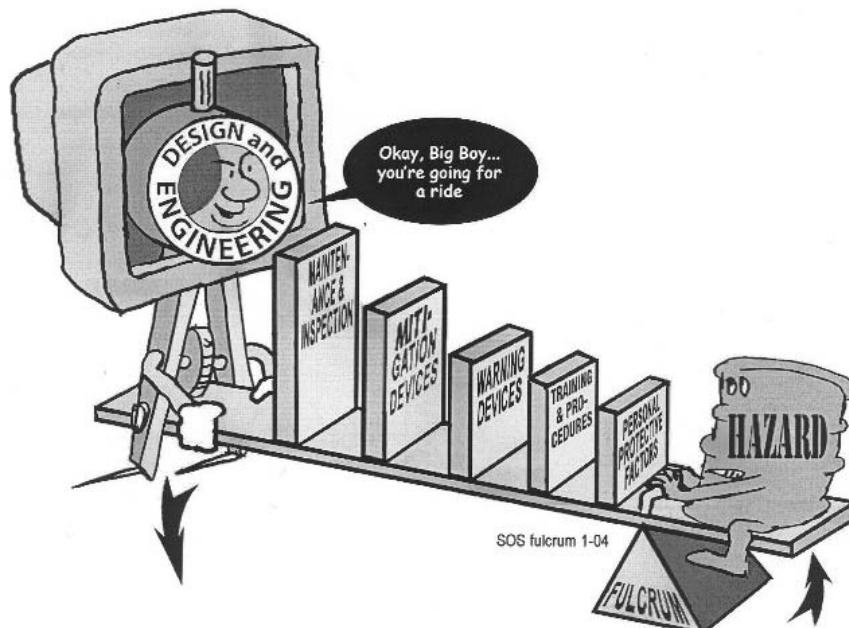
## Background Information

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	
	Workload					
	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.

**Revised October 2006**



**Title: Subcontractor Cut Arm When Emptying 55-Gallon Drum**

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**Lessons Learned Statement**

This method of pouring liquid from one 55-gallon drum into another is unacceptable. Purchase of a pump that will reach to the bottom of a 55-gallon drum utilizes the **Design and Engineering/Technical System of Safety**.

Producing the jagged edge when opening a 55-gallon drum, is a failure of the **Design and Engineering System of Safety** and was the contributing cause of the injury.

## **Discussion**

A subcontractor employee supporting the roof repair received a laceration to the inner left wrist approximately two-inches long and ½-inch deep while transferring a chemical liquid from one 55-gallon drum to another 55-gallon drum. During the transfer, the 55-gallon drum being emptied slipped from its perch and fell. While attempting to stop the fallen drum from contacting his torso, the employee reached out with his left hand and received a laceration (from the jagged open top of the falling 55-gallon drum) just above the top of the leather glove on his inner left wrist.

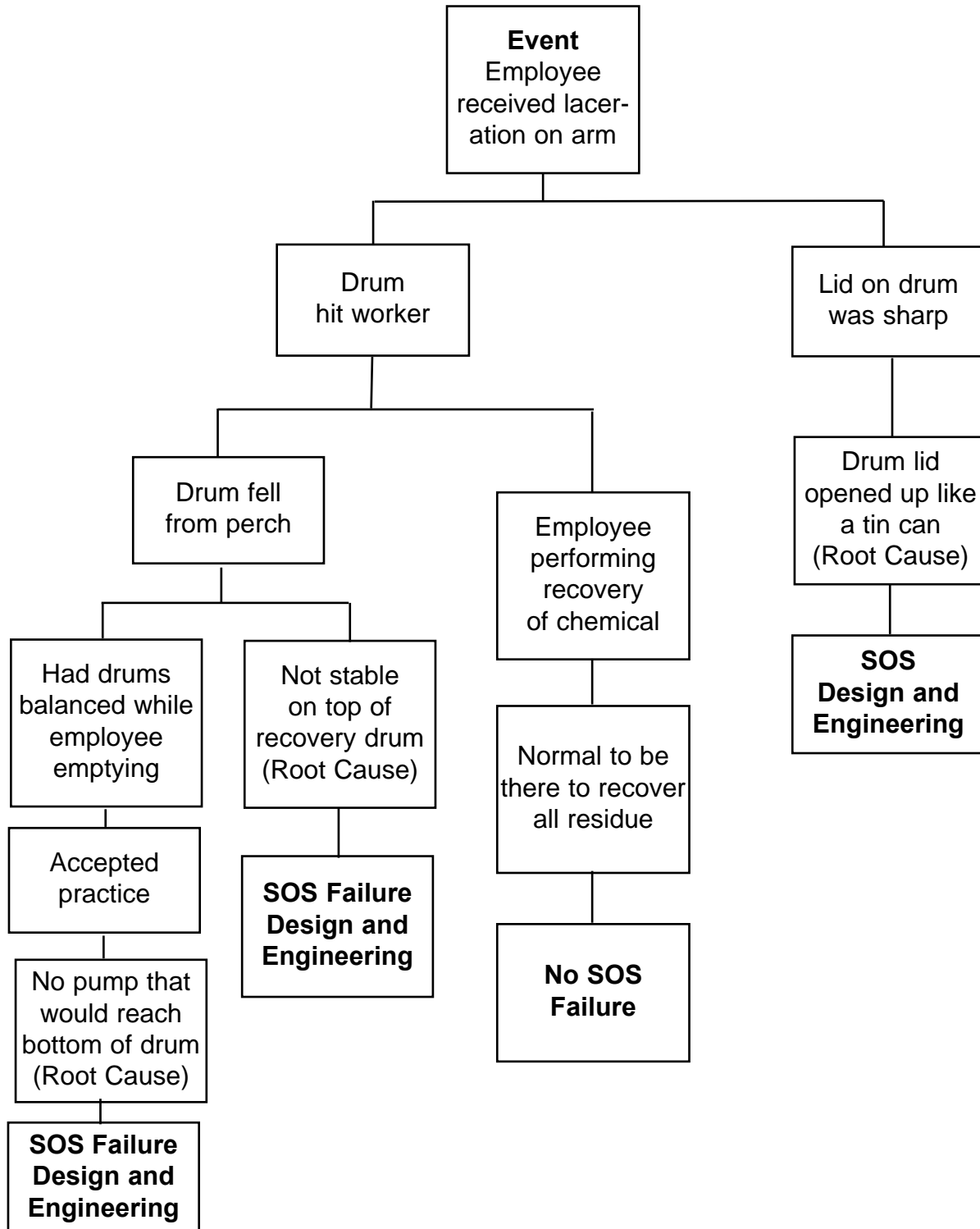
A set of chemicals used to repair the roof are contained in 55-gallon drums. One of these chemicals is susceptible to damage by air and is contained in sealed drums. These chemicals are pumped onto the roof by use of a pump. The pump does not fully empty these drums; and to use all of the chemical possible, the residue remaining is poured into another 55-gallon drum to allow the pump to transfer the chemical onto the roof.

Since this chemical is in a sealed drum, the only way to access the residue and pour it into another 55-gallon drum is to open the top using a can opener-type device. The top is then bent back (exposing the jagged edge of the cut lid). The receiving drum is also opened in this manner. The residue from one drum is poured into the receiving drum by lifting the drum onto the top of the receiving drum and allowing the two bent lid halves to form a saddle to stabilize the drum during the transfer. After several minutes, the top drum is removed for disposal. This process had been evaluated by the subcontractor for hazards and required the use of safety glasses, safety shoes and leather gloves and has been successfully performed by this subcontractor hundreds of times.

The individual involved was in the process of simultaneously draining two 55-gallon drums by this method. As he was removing the first 55-gallon drum from the receiving drum, he heard the second drum start to fall. He turned to face the falling drum as it hit the floor and continued to roll into his torso. He reached out with his left hand to stop the drum and the sharp edge of the cut lid contacted his arm just above the glove causing a laceration.

**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. Purchase a pump that will reach to the bottom of the 55-gallon drum and pump all the liquid from the drum.
2. Discontinue recovering residue from 55-gallon drums.
3. Use a different way of opening 55-gallon drums so as to not create a jagged edge.
4. If draining from one drum to another, devise a way to make drums stable.

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

**Thank you for completing this form.**

# EVALUATION

## Lessons Learned: Subcontractor Cut Arm When Emptying 55-Gallon Drum

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?

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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:

Doug Stephens  
United Steelworkers  
3340 Perimeter Hill Drive  
Nashville, TN 37211

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

# Sign-in Sheet



Name of Class \_\_\_\_\_ Date of Class \_\_\_\_\_

Instructors: \_\_\_\_\_

Please Check One*		Print Name	Signature
H	M		

**\*H = Hourly Worker**  
**M = Management or Salaried Worker**

