



Employee Injured Back While Unloading Cylinders

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 07, Issue 54

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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 |
| 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 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 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 subsystems relate to systems other than Design and Engineering, they should be considered as part of those other system, not Design and Engineering.

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Lessons Learned Statement:

The manual transport of pressurized storage cylinders is a common occurrence in many workplaces today; not only in industrial worksites, but also schools, hospitals and even at home. Many times these storage bottles are large, cumbersome and awkward to move. Also, the designated areas that the cylinders are located in can create an issue when it comes to cylinder replacement or additions. *Systems of Safety* are utilized to provide awareness prevention of the hazards associated from this type of incident.

The practice of working in this manner and not incorporating a better means of transportation that ensures the safe and effective handling of pressurized cylinders is the focus of this Lessons Learned. The most effective and safest system should be installed or made available to complete the task. This includes the proper tools and equipment for the work, which in this case should a cylinder pan for the cylinder dock area. This practice provides is well-defined as a **Design and Engineering System of Safety** approach.

The **Training and Procedures System of Safety** for the workers in the dock area should include:

- Training on the use of a dock plate as an alternate means of unloading cylinder bottles in this area;

- Training on the use of dock plates for unloading of vendor trucks; and
- Transport of bottles on similar height surfaces should be conducted for all affected workers.

Although a cylinder pan is the preferred method for bottle transport, especially when moving bottles on surfaces of large height differences, it should be recognized that dock plates, when used properly, are an effective means to move cylinders. A written and comprehensive procedure should be in place for using dock plates and cylinder pans; emphasizing the proper scenarios and the different appropriate “times of use” for each piece of equipment.

The hazards associated with the moving and storage of pressurized gas cylinders should also be discussed as a “Tool Box Safety Talk” or a “Lessons Learned training event” with workers who regularly perform these tasks.

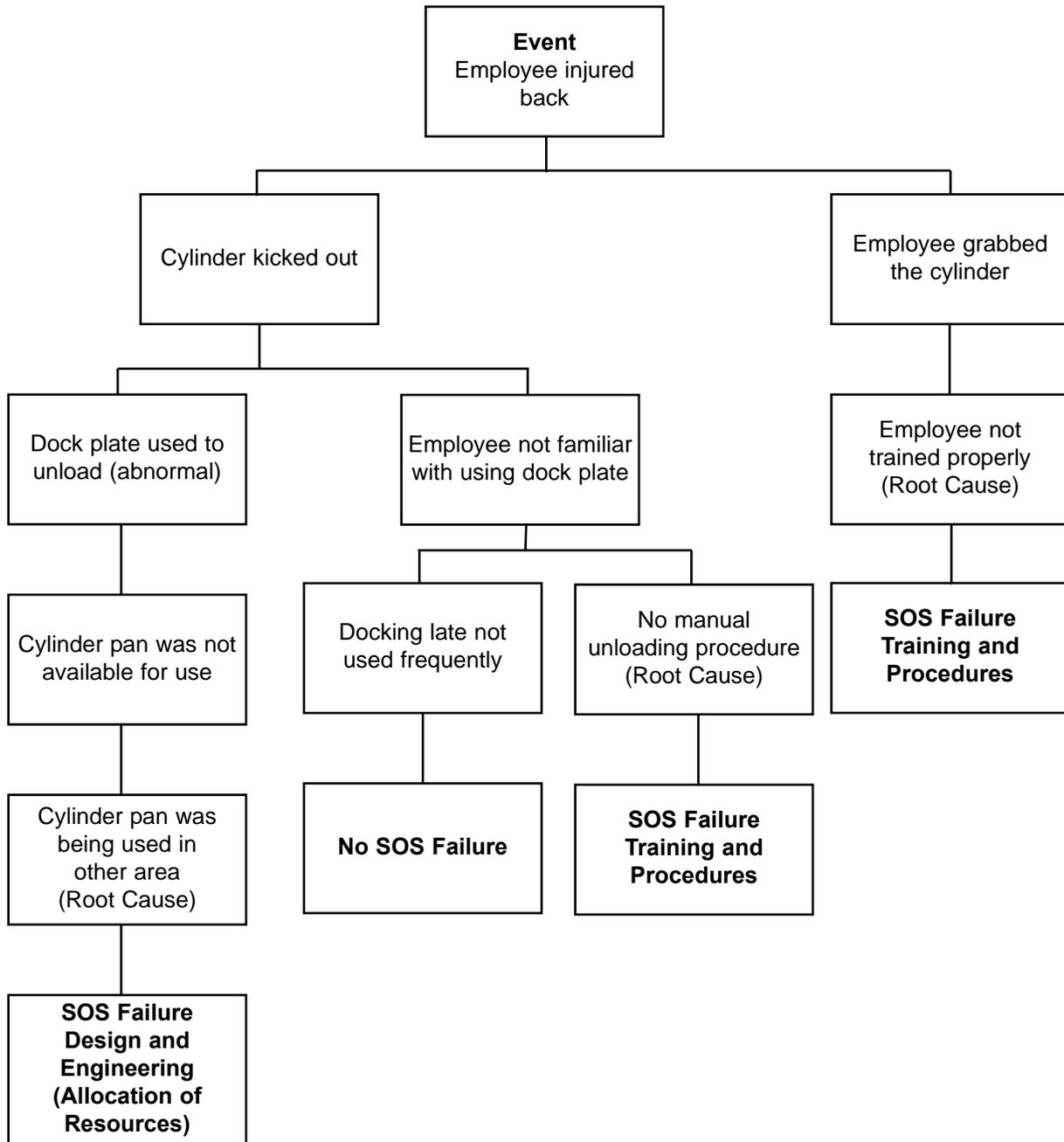
Discussion:

An employee was unloading cylinders from a vendor truck at the full cylinder dock storage area when they injured their back. The normal process with this operation is to position the cylinder pan onto the vendor truck with a forklift; load the cylinders onto the pan; and then move and unload the pan onto the full cylinder dock. However, the cylinder pan was not available and the employee manually unloaded the cylinders using a dock plate.

The vendor truck is approximately 12 inches higher than the storage area dock. The dock plate that was used to transverse from the truck to the storage area was at a 45 degree angle when the employee moved the cylinder in an upright position and rolled it from the truck onto the dock plate. The cylinder kicked out during this process, causing the employee to grab the cylinder to keep it from falling. By reaching abruptly for the cylinder, the employee injured their back.

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. A dedicated cylinder pan should be made available at all times for use in this unloading dock area for cylinder bottles and in all other areas where vendor truck's bottle storage beds are higher than the dock area on which they are unloading. This cylinder pan should be stored and kept in a reasonably close vicinity of the cylinder bottle storage area(s) so that it is readily available for use.
2. Training on the use of a dock plate as an alternate means of unloading cylinder bottles in this area or the use of dock plates for unloading of vendor trucks and transport of bottles on similar height surfaces should be conducted for all affected workers. Although a cylinder pan is the preferred method of bottle transport, especially when moving bottles on surfaces of large height differences, it should be recognized the dock plates, when used properly are an effective means to move cylinders. A written and comprehensive procedure should be written for using dock plates and cylinder pans; emphasizing the proper scenarios and the different appropriate "times of use" for each piece of equipment.
3. The hazards associated with the moving and storage of pressurized gas cylinders should also be discussed as a "Tool Box Safety Talk" or a "Lessons Learned training event" with workers who regularly perform these tasks.

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

Thank you for completing this form.

EVALUATION Lessons Learned: Employee Injured Back while Unloading Cylinders

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.

