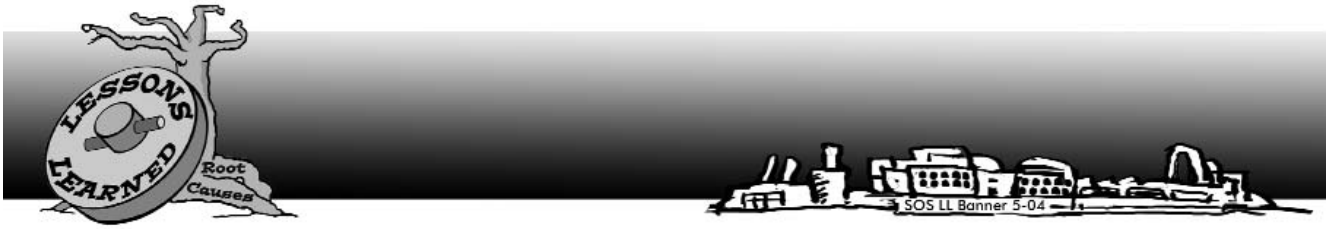

Defective Hydraulic System Causes Lift Gate to Malfunction

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

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Lessons Learned

Volume 06 Issue 13

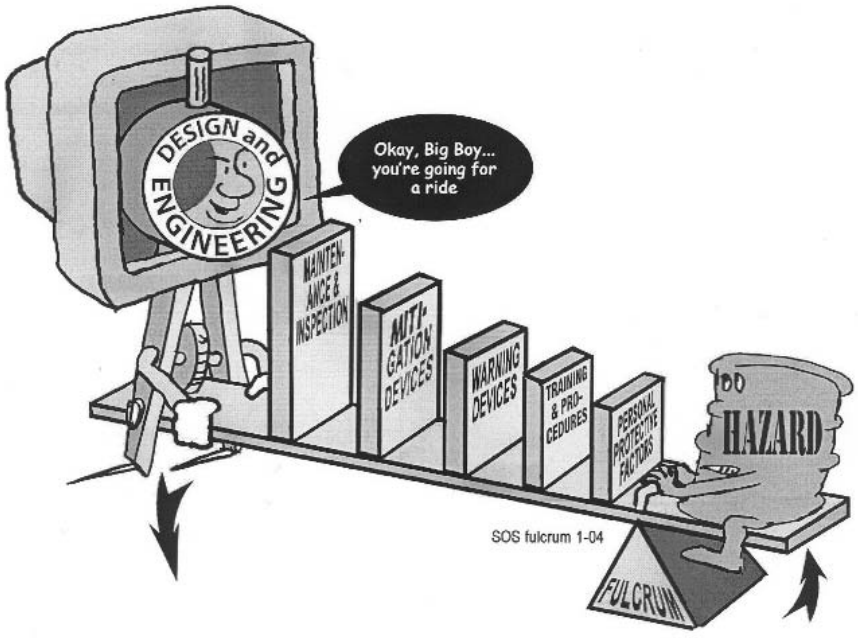
Background Information

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*				T*o 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 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 sybsystem 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.

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Lessons Learned Statement

The failure to lockout and tagout (LOTO) a waste handling truck for maintenance resulted in a near-miss. ***Systems of Safety*** are utilized to provide prevention from this type of incident. The protection provided by the LOTO program provides a well defined **Design and Engineering** ***System of Safety*** approach. The practice of not utilizing the LOTO program where a known hazard exists eliminates the protection it is designed to provide.

Despite knowledge of the condition of the hydraulic system, there was no attempt to take the truck out of service for repairs within the **Maintenance and Inspection** ***System of Safety***.

The **Design and Engineering** ***System of Safety*** for providing protection under LOTO was not utilized. An administrative policy that states that no equipment will be operated where a known defect in the equipment has been identified and the ultimate adherence to this policy would have prevented this near-miss. This **Design and Engineering** safety sub-system of *Organizational Policies* would have provided maximum protection.

By utilizing the **Maintenance and Inspection** ***System of Safety***, a complete inspection of all the waste handling truck's hydraulic systems was conducted; thereby preventing other possible similar incidents.

On the other hand, a chance was missed on April 21, 2005, to prevent this near-miss when the problem with the hydraulic system was first identified. This was an opportunity to fix the hydraulic system by treating the identification of the hydraulic failure as a "near-miss" and not waiting for the hydraulic system to malfunction before declaring it a near-miss.

Discussion

On June 13, 2005, it was reported that the hydraulic lift gate on a Waste Handler truck had unexpectedly released and fallen in close proximity to an operator.

This particular model of lift gate works in two separate steps. First, the gate is released by pulling a cable from behind the gate which releases the locking pins and allows the hinged gate to be lowered by hand from the vertical to the horizontal position. The second action is to operate the controls for the hydraulic system, which lowers the gate to ground level.

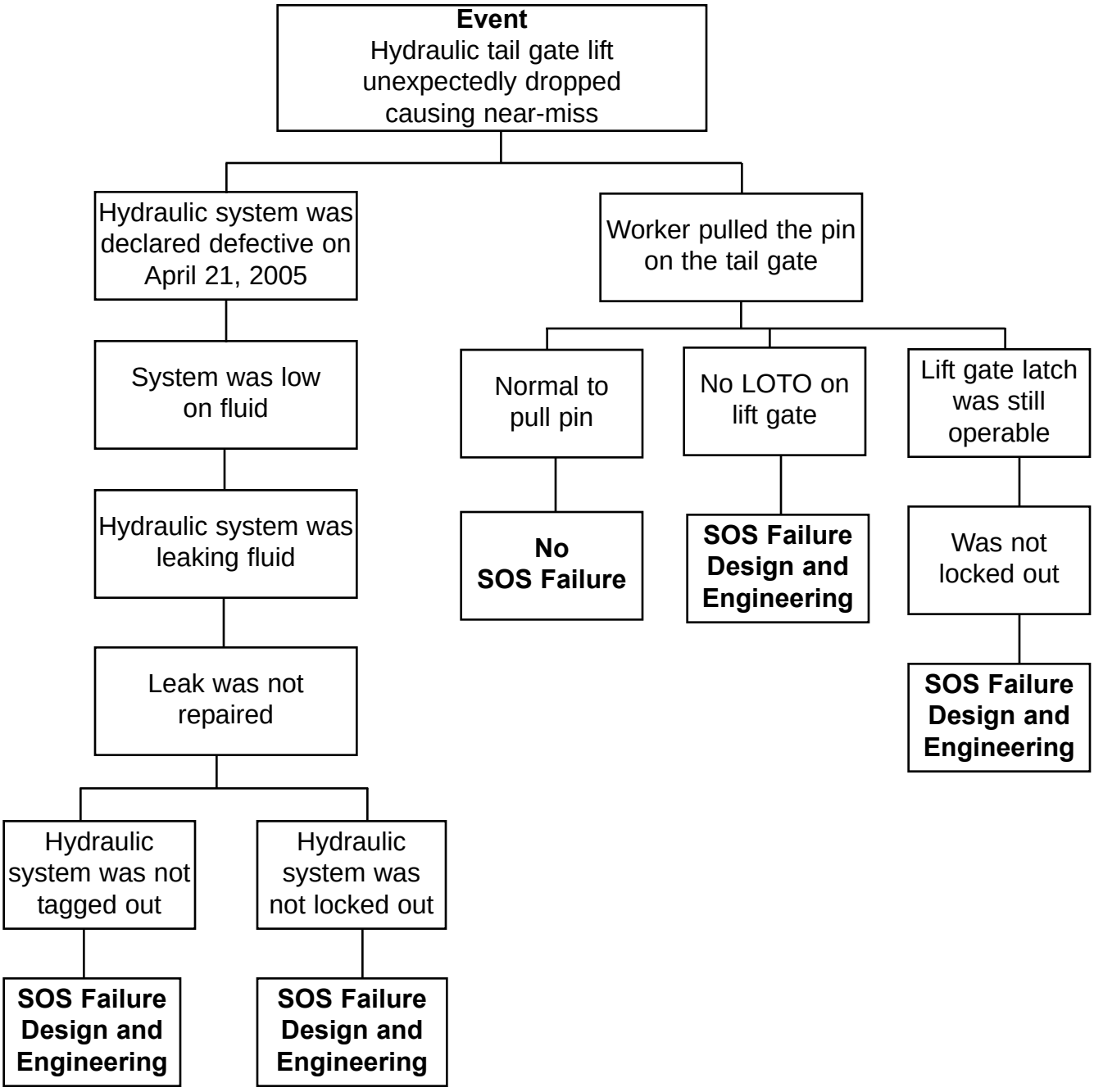
This incident occurred when the operator performed the first step by releasing the locking pins. The hydraulic system did not work properly allowing the gate to freefall to the ground.

Investigation into the near-miss found that a "Warning-Defective Equipment" tag had been placed on the hydraulic control on April 21, 2005, some two months prior to the gate falling on June 13, 2005.

According to policy, this equipment should have been locked out and tagged out to prevent the pins from being released. The hydraulic controls were tagged and not locked and the pins were neither locked nor tagged.

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. The waste handling trucks should be placed on a routine Maintenance and Inspection program which includes the hydraulic system.
2. Make sure when a tag is hung on the hydraulic system that a lock is also placed on the locking pins that keep the tail gate lift in place.
3. When a defect is found in a piece of equipment, it should be immediately taken out of service and repaired.

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. Complete the chart below by:

- Putting an "X" beside the recommended actions you think your employer would implement at your workplace.
- Putting an "X" beside the recommended actions you think should be implemented at your workplace.
- Prepare to share with the group the reasons for your answers.

Employer	Recommended Actions	You
	1. The waste handling trucks should be placed on a routine Maintenance and Inspection program which includes the hydraulic system.	
	2. Make sure when a tag is hung on the hydraulic system that a lock is also placed on the locking pins that keep the tail gate lift in place.	
	3. When a defect is found in a piece of equipment, it should be immediately taken out of service and repaired.	

EVALUATION

Lessons Learned: Defective Hydraulic System Causes Life Gate to Malfunction

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 this page **plus the Education Exercise and Evaluation for each participant** 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.

Sign-In Sheet

Name of Class_____ Date of Class_____

Instructors: _____

Please Check One* H	M	Print Name	Signature

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