

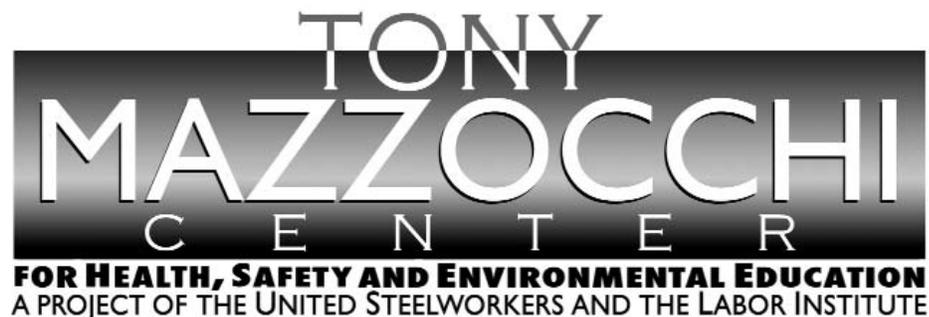


## Worker Fatality

### 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**

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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> Design and Engineering of Equipment, Processes and Software Management of Change (MOC)** Chemical Selection and Substitution Safe Siting Work Environment HF	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
	<b>Organizational (must address a root cause)</b> 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**					

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 system of removing pins from boom sections is known to place the worker in a dangerous position. The **Design and Engineering System of Safety** saves lives by removing the worker from this danger and replacing the worker with a mechanical or automated design to perform this task. Before another worker dies, the crane industry must design and engineer a safer mechanism for replacing boom sections.

*Job Hazard Analyses* and *Pre-startup Safety Reviews* are **Systems of Safety** designed to identify, mitigate and alert workers to the dangerous work conditions specific to their job site. These **Training and Procedures System of Safety** subsystems provide a crucial list of precautions designed to save lives.

A crew was assigned to perform a crane operation. The **Design and Engineering System of Safety** provides organizational programs to ensure that worker skills and qualifications are current and sufficient to perform their specific job. An organizational program to systematically inspect the qualifications and skill level of every crane crew member would have prevented this tragic death.

*Codes, Standards and Policies* are an *Organizational* subsystem of the **Design and Engineering System of Safety** which requires employers to establish a program for complying with regulated codes, standards and guidelines for specific industries such as "Cranes, Derricks, Hoists..." Regulations demand employers "comply with the manufacturer's specifications and

limitations applicable to the operation of any and all cranes and derricks.” (Standards-29 CFR). These specifications were available to the employer and would clearly alert all workers to the dangers of boom replacement. Tragically, the employer did not comply with this regulation and one of their workers died. This System of Safety would have prevented this death.

**Discussion:**

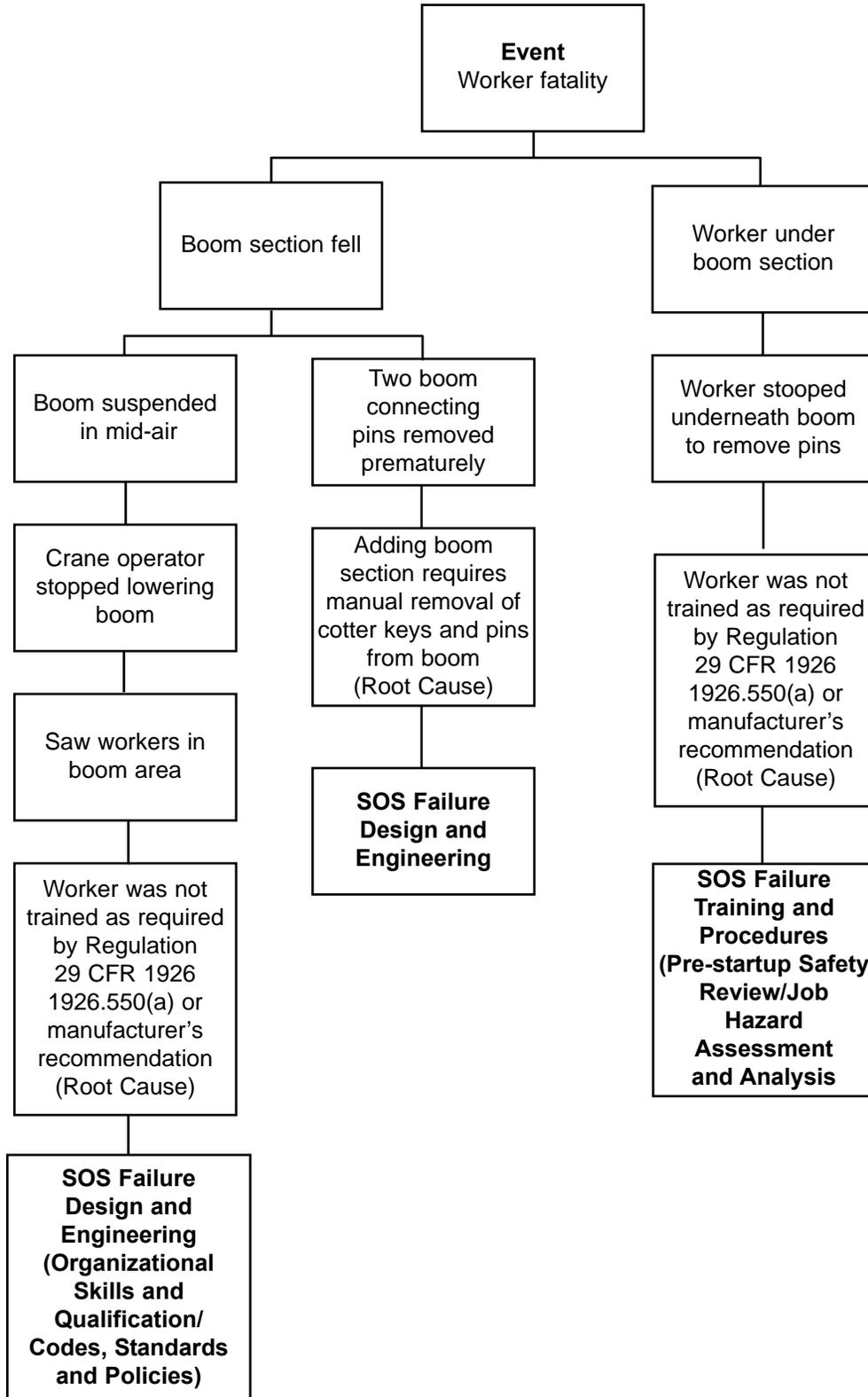
Three members of a crane crew were performing a job to add a section of boom to a crane. Manufacturer operating procedures and hand signal directions were located inside the crane cab.

None of the crew members were trained in the procedure, despite regulations requiring the employer to comply with the manufacturer's specifications. Consequently, the crane operator stopped the boom in mid-air to allow workers below to clear out of the area. While the boom was suspended midway, one of the workers stooped beneath the crane boom to remove the pins securing the lower boom sections together in preparation to add the next section. After the second pin was removed, the boom fell; crushing the worker underneath.

The crane operator did not realize the worker was attempting to remove the pins and did not have time to warn him before the boom fell. Procedure states that the boom be lowered to the ground and be resting on heavy timber blocks before the pins are removed. Under no circumstances is anyone allowed to stand on, in or under the boom when removing connecting pins.

**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.



**Recommendations:**

1. Design a mechanical or automated means to remove cotter keys and pins from boom sections.
2. Develop a system to ensure compliance with codes and standards for crane operation: 29 CFR 1926.550(a)(1): “the employer shall comply with the manufacturer’s specifications and limitations applicable to the operation of any and all cranes and derricks. Where manufacturer’s specifications are not available, the limitations assigned to the equipment shall be based on the determinations of a qualified engineer competent in this field and such determinations will be appropriately documented and recorded. Attachments used with cranes shall not exceed the capacity, rating or scope recommended by the manufacturer.”
3. Develop a system to ensure skills, qualifications and training records of crane operators and crane crews are documented and current before any work is performed. Perform Job Hazard Analysis and Pre-startup Safety Review before start of work.

### 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.

- 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: Worker Fatality

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 International Union  
3340 Perimeter Hill Drive  
Nashville TN 37211

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



