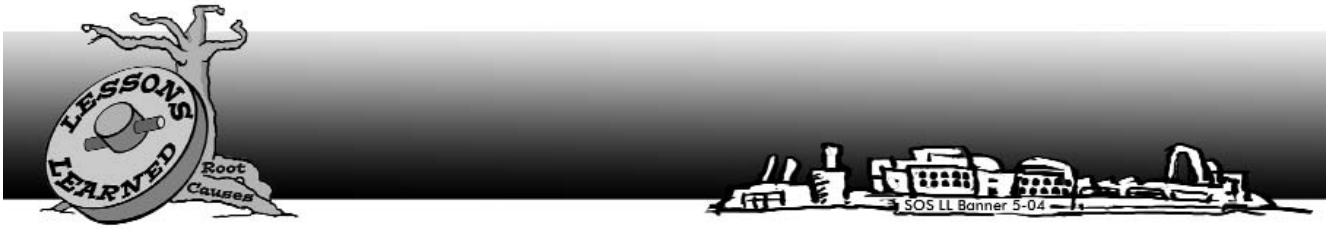

Worker Becomes Ill from Ingesting Chemicals

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 07, Issue 12

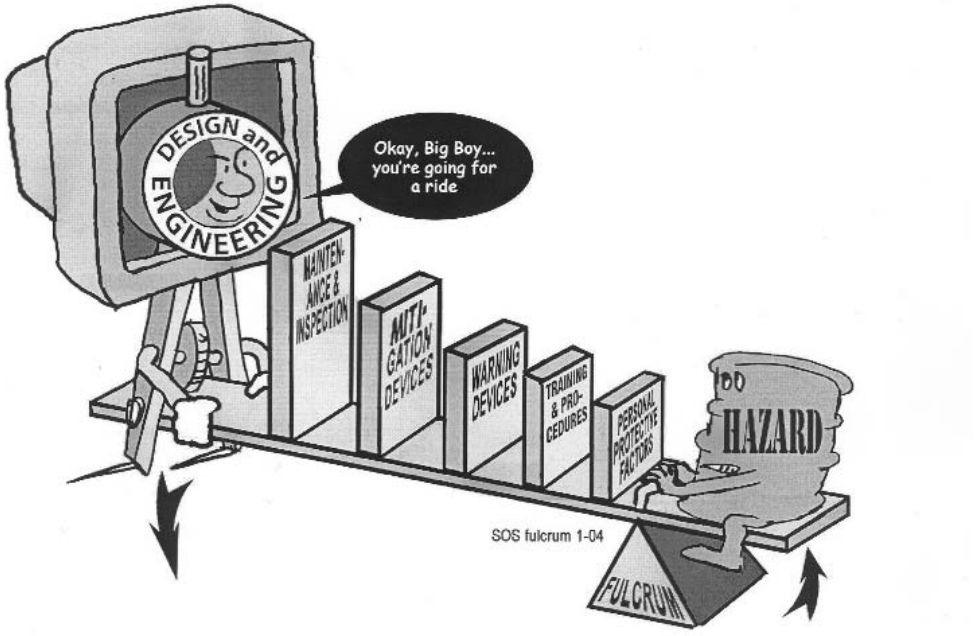
Background Information

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** 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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Title: Worker Becomes Ill from Ingesting Chemicals

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Lessons Learned Statement:

The Logic Tree quickly took us to a ***Systems of Safety*** failure for the tipping of the pontoon. **Maintenance and Inspection** of the pontoons would have prevented the worker from being thrown into the pond.

Even if the **Design and Engineering** recommendations related to the pontoon; i.e., designing pontoons to be connected, are implemented and if the job is redesigned so that workers will not have to climb onto pontoons, the chemical hazards are still present in the pond. That hazard has not been removed from the workplace. There is potential for exposure every time the worker has to get into the boat to cross the pond to access the task. The search for less hazardous chemicals must continue as a **Design and Engineering** practice and the use of **Mitigation** measures to keep ponds free of hazardous chemicals should be a priority. Hazard Communication and HAZWOPER training should be provided in the **Training and Procedures** ***System of Safety*** to workers in the area of these hazards.

Discussion:

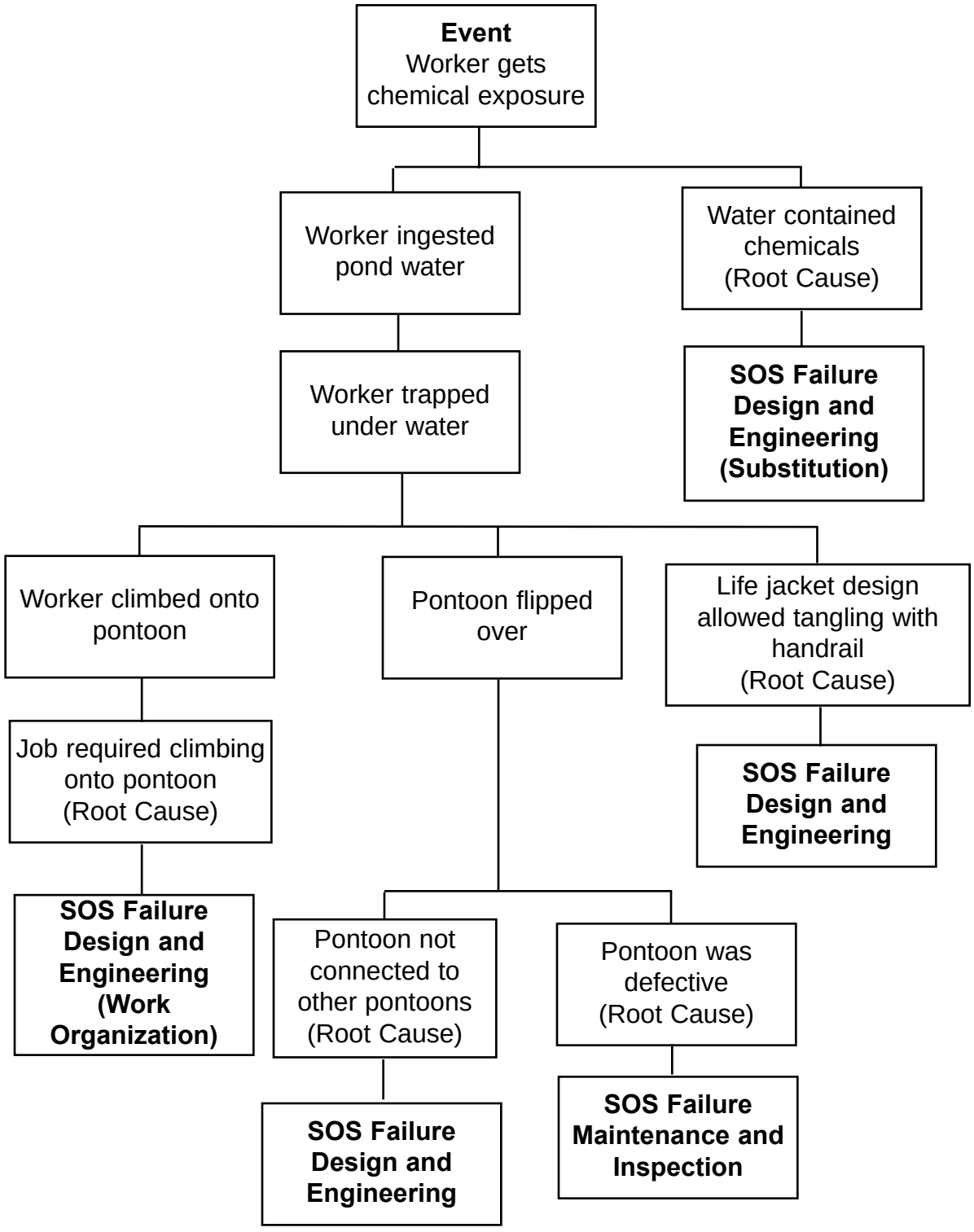
The task involved greasing motors and pumps on three individual floating pontoons located in the tailing pond. The workers are required to use a small row boat to get out to the pontoons. They are required to wear a life vest in the boat and on the pontoons.

Two of the three pontoons had been boarded and the equipment greased. As the workers in the boat approached the third pontoon, the worker involved in the near-miss noticed the third pontoon was partially submerged on one side. The worker did not think anything of the partially submerged pontoon. The worker boarded the partially submerged pontoon on the high side. Once the worker was on board, the pontoon began to shift and started to flip over. The pontoon flipped over before the worker had an opportunity to get off. The worker was thrown into the water and pulled underneath the surface by his life vest which had become entangled in the pontoon railing. The submerged worker subsequently was able get free of the pontoon railing and swim to the surface of the pond. The worker then swam to shore. After reaching shore, the worker became nauseated from ingesting the contaminated water in the tailing pond.

The hazardous chemicals in the water the worker ingested include diesel fuel, pine oil and Nokes. The worker was taken to the hospital for medical treatment related to ingesting the chemicals in the tailings pond water. After receiving the medical treatment, the worker was released from the hospital.

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

The employee had no recommendations to fix or prevent the accident. (Why not?)

The pontoon was removed from the pond for inspection and repairs which are listed below:

1. Replace the two lower portions of this particular pontoon.
2. Check all pontoons for deficiencies in design or structure.
3. Recommendation to evaluate the design of the pontoons for greater safety.
4. Recommendation to secure the three pontoons together to prevent the possibility of flipping over.
5. Perform safety audit for the best practice and safe practice of securing the pontoons together.
6. Recommendation of extending grease lines for the motors and pumps to the edge of the pontoon so the employee would not have to board the pontoon.
7. Recommendation to perform safety audit for grease line extension.
8. Recommendation to review potential employee exposure to the hazardous chemicals in the tailings pond.
9. Recommendation to properly train employees in hazard communication and HAZWOPER.
10. Recommendation to review options or possibilities to eliminate exposure to chemical hazard or provide additional PPE and training.
11. Evaluate danger of loose cords from safety vest.

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.)

EVALUATION

Lessons Learned: Worker Becomes Ill from Ingesting Chemicals

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 and the Sign-in sheet** 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