



Clamp Truck Ignites

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 08, Issue 60

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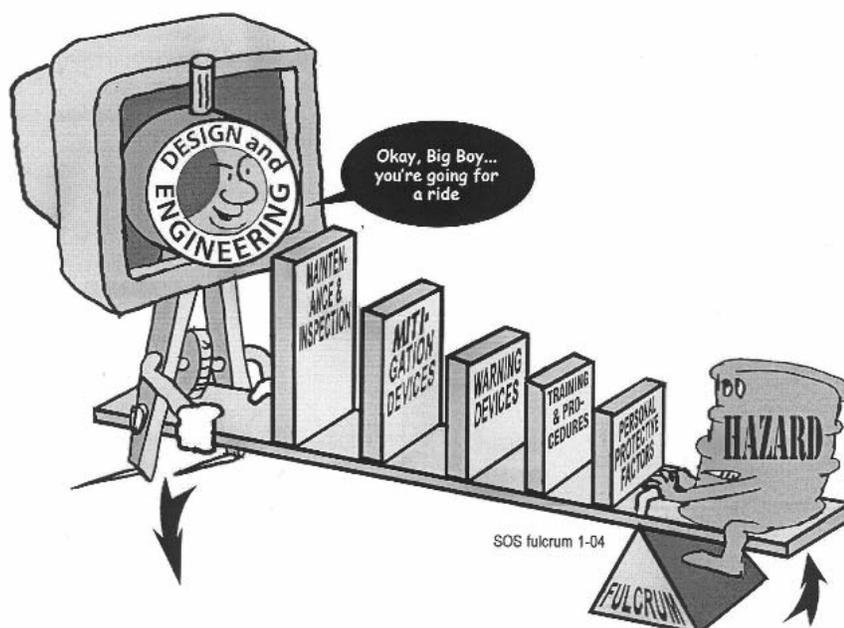
Background Information

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 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.

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Lessons Learned Statement:

This incident actually started many years ago when a pressure switch was installed on a clamp truck and no inline fuse was installed. The **Training and Procedures *System of Safety*** would have prevented this incident from occurring.

The **Maintenance and Inspection *System of Safety*** on all propane gas trucks will identify if there are any loose or frayed wires or missing fuses. Applying this ***System of Safety*** will reduce the chances of clamp trucks catching on fire.

Discussion:

A clamp truck (Fig. 34-1) operator was transporting and loading rolls of paper in the Shipping Department. While operating the truck, he realized that the whole engine seemed to be engulfed in flame and flames were coming out the sides of the truck. The worker reached for the nearest fire extinguisher and put out the fire.

The operator opened the hood of the truck and saw that the pressure switch (Fig. 34-2) on top of the engine was on fire. The investigation revealed that this had happened numerous times on other trucks.

The pressure switch is a device used to inform the truck operator when his truck is low on fuel. When the fuel is low, an indicator light comes on in the instrument panel. Prior to his truck catching on fire, the operator noticed that the indicator light had been flickering and seemed to have been shorting. The truck's fuel tank had been low.

This was an older model clamp — at least 20 years old. Originally the truck had no indicator light, so the repair shop installed a pressure switch (Fig. 34-3) on the motor. But, no inline fuse had been installed. The common practice at that time was not to install fuses when changes or additions were made to the wiring. Now the practice is to install an inline fuse (Fig. 34-4) every time wiring is added or changed.

A loose or frayed wire created resistance and the heat increased enough to melt the diaphragm in the pressure switch. Propane started leaking once the diaphragm had melted. The combination of heat, propane and oxygen caused the pressure switch to ignite.

The burnt pressure switch was removed and a new one was installed with an inline fuse.

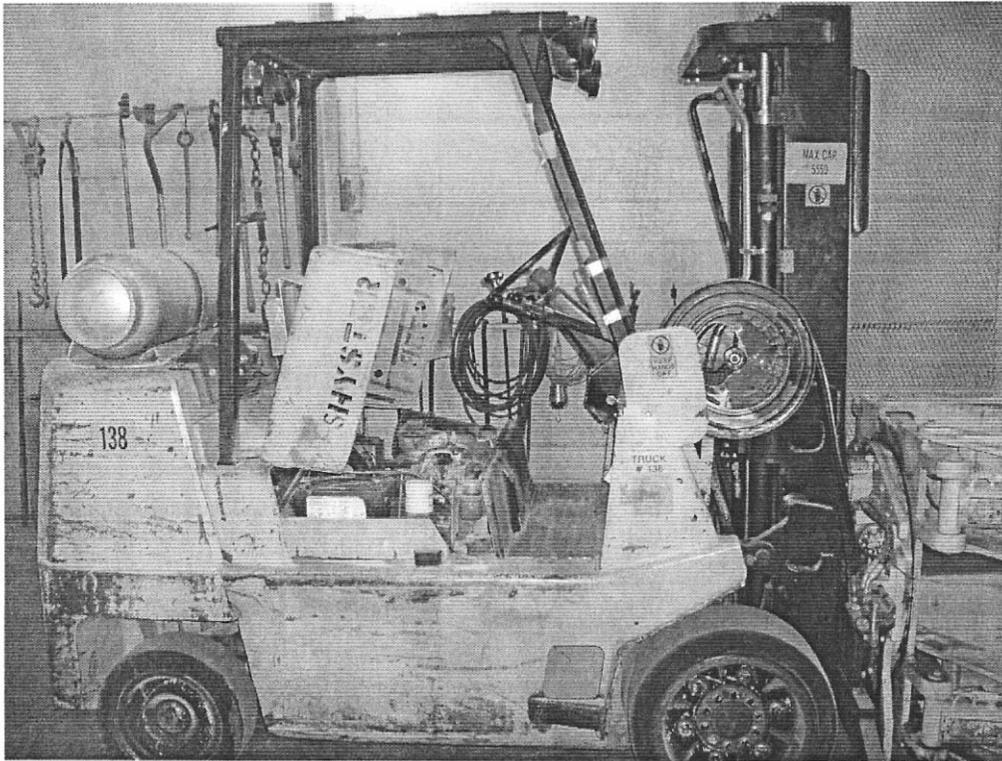


Fig. 34-1. Clamp truck that caught on fire

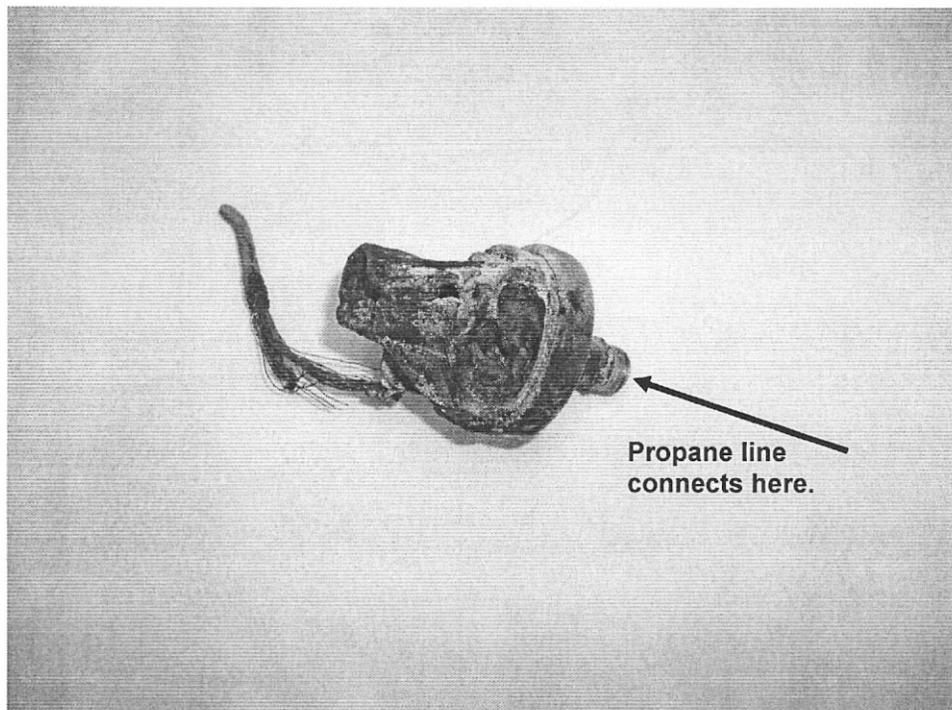


Fig. 34-2. Pressure switch that ignited.

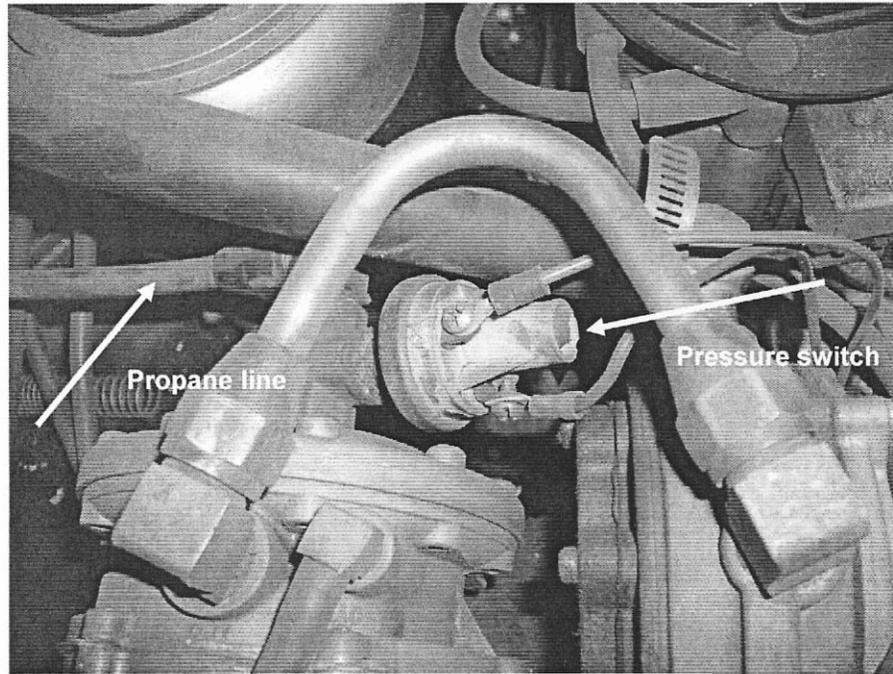


Fig. 34-3. Pressure switch

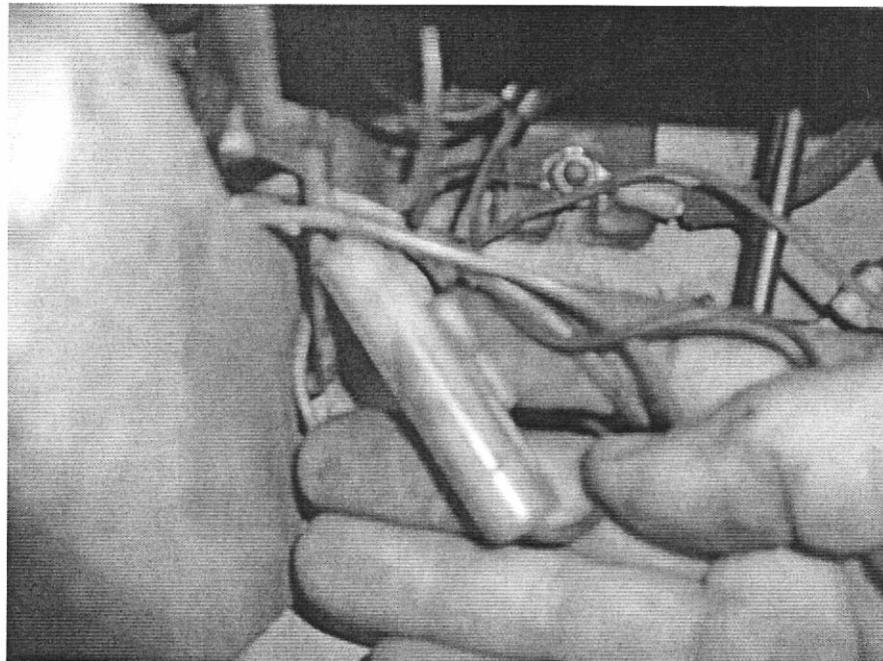
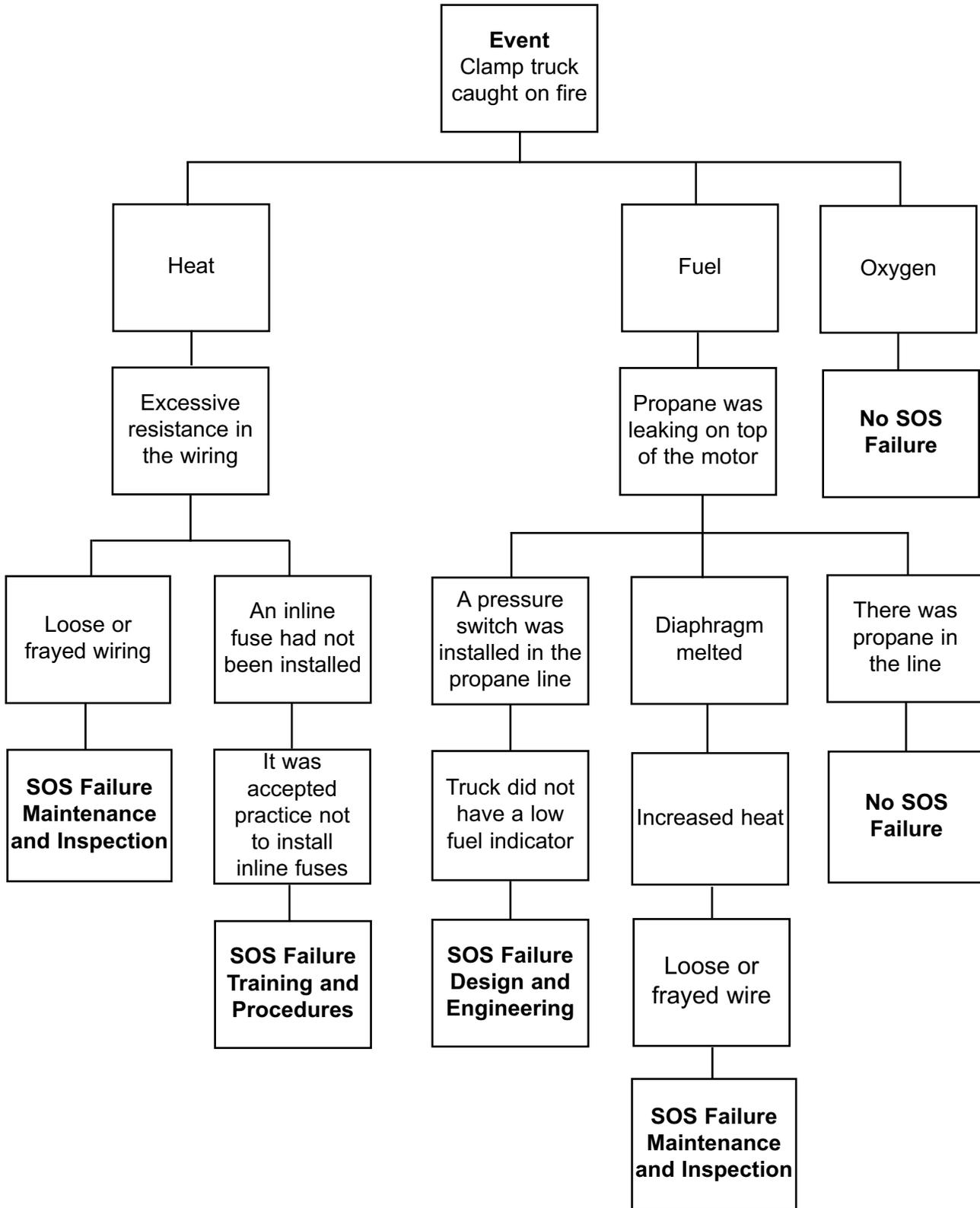


Fig. 34-4. Inline fuses

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. Include inspection of wiring in basic care on all propane gas trucks.
2. Inspect and verify that fuses are installed in the wiring on all propane gas trucks that have been retrofitted with pressure switches.

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

Thank you for completing this form.

EVALUATION

Lessons Learned: Clamp Truck Ignites

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?

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 10);
3. The Trainer’s LL Success Inventory form (pages 11 and 12);
4. The evaluation for each participant (page 13); and
5. The Sign-in sheet (page 15) to:

<p>If you are a TOP Site (excluding DOE TOP Sites)</p>	<p>Send to: Steve Cable 2915 Gradient Drive St. Louis, MO 63125</p>
<p>All other sites (including DOE TOP Sites)</p>	<p>Send to: Doug Stephens United Steelworkers 3340 Perimeter Hill Drive Nashville, TN 37211</p>

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

