



## Cleanout Hatch Blown Off Duct

### 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.



This material was produced by the Labor Institute and the United Steelworkers International Union under grant number SH-17045-08-60-F-42 Susan Harwood Training Grant Program, for the Occupational Safety and Health Administration, U.S. Department of Labor. It does not necessarily reflect the views or policies of the U.S. Department of Labor, nor does mention of trade names, commercial products or organizations imply endorsement by the U. S. Government.

### **Lessons Learned**

**Volume 09, Issue 10**

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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 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.

**Revised October 2006**



**Title:** Cleanout Hatch Blown Off Duct

**Identifier:** Volume 09, Issue 10

**Date Issued:** July 25, 2009

**Lessons Learned Statement:**

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Workers narrowly escaped injury when a header was over-pressured to an unsafe condition and the cleanout hatch was blown off of the housing ductwork. No workers were injured during this incident, but could have been had a worker been in closer proximity to the hatch. The over-pressuring could have been prevented if a proactive *Systems of Safety* approach was used.

Using the **Mitigation Devices System of Safety** by installing an auto shut-off switch, that would close both gas and air supply valves when the fuel mixture is out of specifications, would ultimately prevent the inappropriate fuel mixture condition that caused the backfiring of the positions upon starting.

It was also identified that the hatch cover was not secured as well as it should have been. Using the **Maintenance and Inspection System of Safety** approach would ensure that all hatch covers were secured in a way that would have prevented them from being blown off of the ductwork.

**Discussion:**

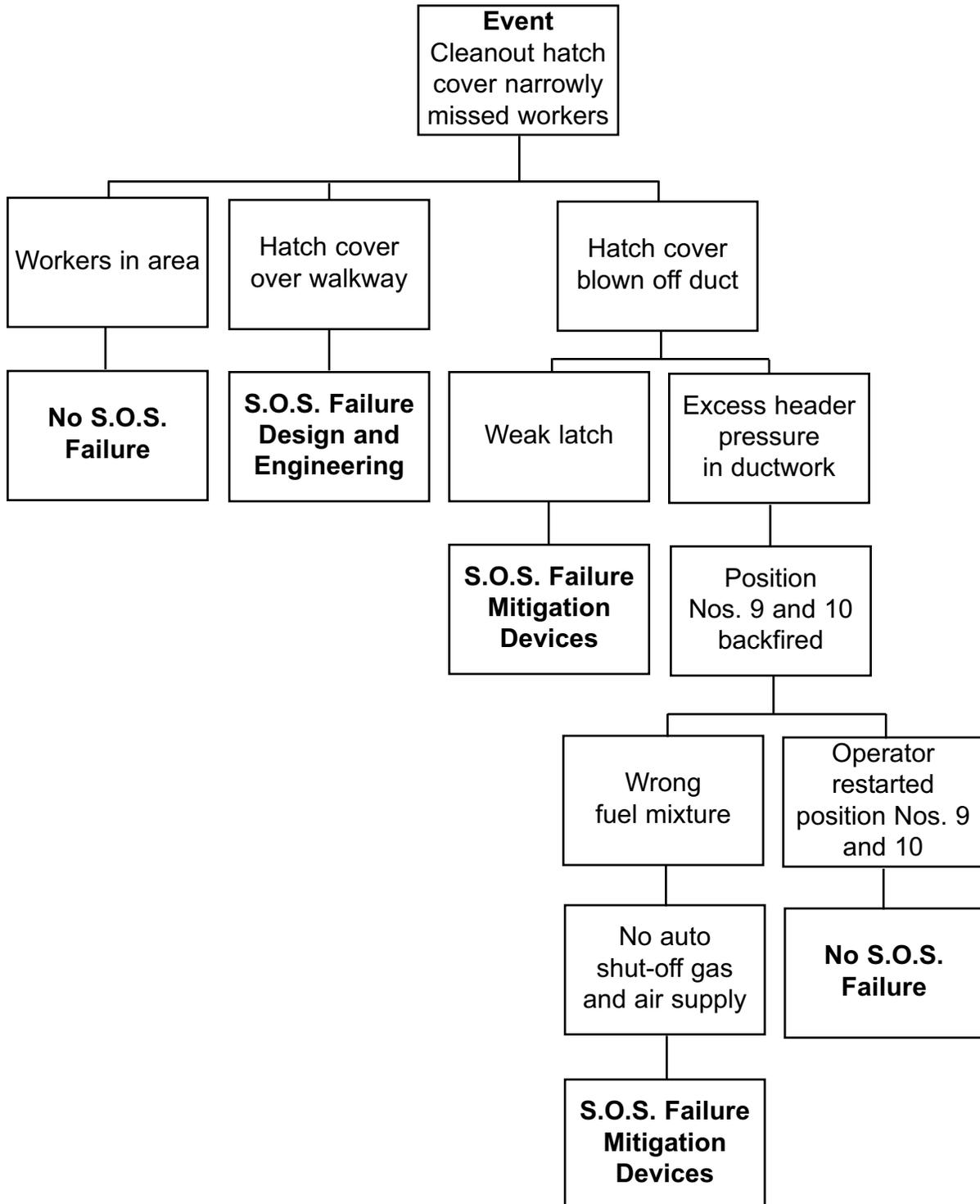
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After a Friday morning cleanout of the gas-fired equipment used in the process, it was time to start positions No. 1 through No. 12. The Line Operator started ramping up each position in order, starting with position No. 1. The first eight positions fired with no problems noted, but positions No. 9 and No. 10 failed to light. The positions not firing caused the fuel mixture to be out of specifications within the system.

The second attempt to light the positions was successful. But, due to the fuel mixture being out of specifications when the positions lit, it caused a backfiring of both positions, resulting in over-pressuring the header and blowing the cover off of the No. 10 position ductwork. Fortunately, the cover missed the workers.

## 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**

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1. Install an auto shut-off switch that would close both supply inlet valves of the gas and air when the fuel mixture is out of specifications.
2. Assure that all hatch covers are secured in a way that would prevent them from being blown off of the ductwork.

## Education Exercise

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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.

**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: Cleanout Hatch Blown Off Duct

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:

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

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

# SIGN-IN SHEET



*(Please print clearly.)*

**Class Title:** \_\_\_\_\_ **Class Completion Date:** \_\_\_\_\_

**Location (City, State)/Facility:** \_\_\_\_\_

**Grant Program:** \_\_\_\_\_ **Dist. & LU #:** \_\_\_\_\_

**Instructors: 1)** \_\_\_\_\_ **2)** \_\_\_\_\_

**3)** \_\_\_\_\_ **4)** \_\_\_\_\_ **5)** \_\_\_\_\_

**Name (Print first and last.)**

**Check one:**

		Hourly	Management
1			
2			
3			
4			
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6			
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11			
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