

Transporting Technetium Trap Causes Radiological Contamination

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 07, Issue 4

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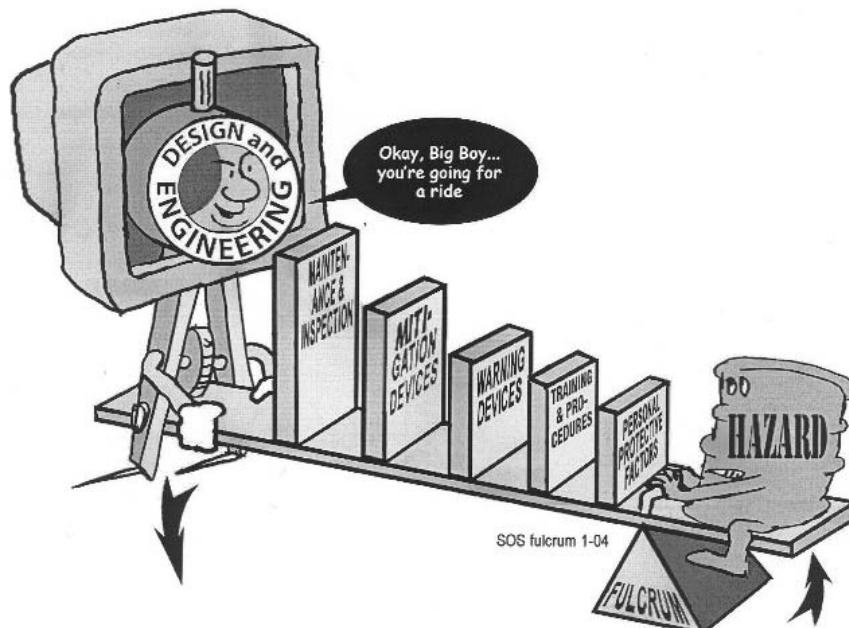
Background Information

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 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 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 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: Transporting Technetium Trap Causes Radiological Contamination

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Lessons Learned Statement:

The inability to keep radioactive pellets from becoming lodged between a Technetium trap and a radiation shield caused a radiological contamination of a roadway between two work stations.

Developing a **Training and Procedure *System of Safety*** that requires the radiation shield to be removed before changing the radioactive pellets not only prevents the pellets from accidentally becoming lodged between the shield and trap but would allow an successful radiological survey.

Discussion:

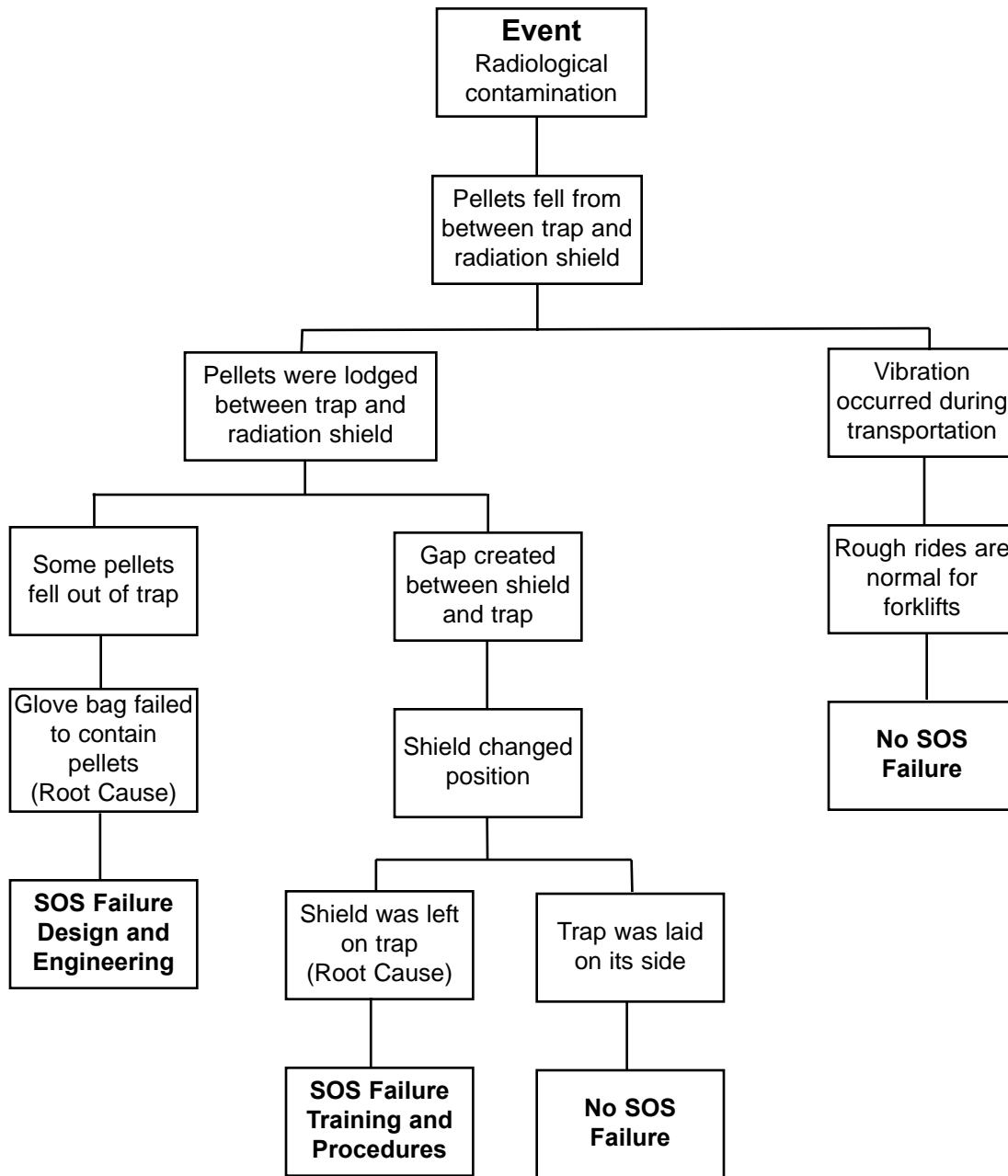
While transporting a Technetium Trap (a vessel containing magnesium fluoride pellets (MgF_2) which is used to remove Technetium from liquid uranium), it was discovered that some of the pellets had fallen off the trap causing radiological contamination in several locations throughout the facility. The traps were being transported after having the contaminated pellets removed. After pellets are removed, the refurbishment of the traps includes adding and conditioning new pellets at another facility across the plant.

Removing the contaminated pellets require the pellets to be vacuumed from the trap. A glove bag was positioned over the port to minimize spread of the pellets. The radiological survey that was performed on the empty trap showed no radiological issues.

During the investigation it was discovered that about a half cup of pellets had become lodged between the trap and the radiation shield which surrounds part of the trap. The radiation shield was not removed before the survey was performed. Nor was it removed while the pellets were being removed; but rather, the trap was laid on its side with the shield in place. This created a gap between the trap and radiation shield which caused some of the pellets to become lodged between in the gap.

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. Look at design of glove bag to see if improvements can be made.
2. Remove radiation shield before the vacuuming process to ensure the removal of all pellets.

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: Transporting Technetium Trap Causes Radiological Contamination

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 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*		Print Name	Signature
H	M		

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

