

Incident or Event

Did you know that three employers in Manitoba were convicted on the same offence in the span of two years? Hot Work on a barrel/drum. All three incidents occurred when a technician attempted to cut into a barrel/drum that had previously contained flammable materials. The existing fumes/vapours ignited and caused an explosion.

Hot Work is any process that generates flames, sparks or heat – it includes welding, cutting, grinding and sawing.

Drums or barrels which appear to be empty may contain residues of flammable material to cause an explosion when heated and turned into vapour.

Flammable liquids and vapours come in many forms such as gasoline, diesel, gun wash, oil, paints, solvents, glues and cleaning agents. If a welding torch, cutting torch, electric arc, grinder or any heat source is applied to a drum or barrel (either sealed or open) containing flammable material (solid, liquid, vapour) the drum/barrel can explode violently.

Never apply heat to any drum or container before knowing its contents and assessing the risk. Rule of thumb, if a container had previously contained flammables, DO NOT perform any hot work on that container unless properly purged.

Hot work should not be carried out unless it is authorised and supervised by an experienced and competent supervisor, who has knowledge of the work, the risks involved and precautions to be taken.



Outcomes

One Technician was killed as a result of the explosion, and two were seriously injured.



Causal Factors

Improper disposal of Flammable Containers

- Flammable containers should be properly disposed of. If these containers were not on site, they wouldn't have been able to modify them. Elimination of hazards is the first step in the hierarchy of control.

Modifying objects to serve another purpose.

- It is common in the Service Industry to modify items to serve a different purpose. This can cause unforeseen hazards. As these "new items" are not designed for this purpose.

No Risk Assessment prior to starting work on the drum.

- A Risk Assessment could have determined that the drum had contained flammable contents before hand. The work would only begin after the risk was nullified.

The Drum/Barrel had not been properly purged of its flammable contents prior to the task being performed. As a result, vapors entrapped in the container exploded.

- If there is no alternative to hot work, the tank, drum or container should be emptied and washed thoroughly by steam cleaning or other means. To reduce the risk, the air in the tank can be replaced, e.g. by using water. Ensure the tank is not sealed and can be vented to release steam.

Shared Learning

Know Your Responsibilities – Supervisors should be trained on their roles and responsibilities as they pertain to safety. Workers should be trained on safe use of equipment and, should know their responsibility to report unsafe working conditions or inadequate equipment.

Proper Disposable of Flammable Materials – Train and educated workers on the proper disposable of flammable containers. If you eliminate the hazard there will no longer be a risk of incident.

Assess Risks – This is critical when performing non-routine tasks – these are the jobs that generally don't have written procedures, training, or properly allocated equipment.

Establish Expectations – Train and educate workers on the limitations of equipment, conditions of safe use, and on established rules. (i.e. procedures for purging barrels/drums)



Discussion

Leaders should review the above at a meeting and use the following questions to engage their teams to identify similar hazards. Leaders should note answers, follow up, implement corrective actions, and positively reinforce worker responsiveness.

1. Where do we have similar hazards (Flammable Containers) (Hot Work)?

2. Where do we or have we performed similar tasks or processes?

3. Which of the causes associated with the incident are common in our facility?

4. Where else can we apply the shared learning?

5. For any similar hazards in our workplace, what is the level of risk?



Probability	3	Likely	Medium Risk 3	High Risk 6	Extreme Risk 9			
	2	Unlikely	Low Risk 2	Medium Risk 4	High Risk 6			
	1	Highly Unlikely	Minimal Risk 1	Low Risk 2	Medium Risk 3			
Risk Matrix			1	Slightly Harmful	2	Harmful	3	Extremely Harmful
			Severity					

Probability: The likelihood of incident		Severity: The degree of consequence if an incident occurs	
1	Highly Unlikely - Could happen, but probably never will	Slightly Harmful -	Minor injuries or discomfort. May require first aid treatment.
2	Unlikely - May occur at some time	Harmful -	Injuries or illness requiring medical aid.
3	Likely - Expected to occur at some time	Extremely Harmful -	Injury or illness resulting in permanent impairment or death.

Assessment	
Risk Rating	Risk
9	Extreme - Urgent action required to eliminate or minimize risk
6	High - Immediate action required to eliminate or minimize risk
3-4	Medium - Short-term action required to eliminate or minimize risk
2	Low - Long-term action required to eliminate or minimize risk
1	Minimal - No action required if risk is eliminated or minimized

6. What can we do to eliminate or reduce the risk?

Hazard	Risk (R/Y/G)	Control Plan	Due Date

SIGN: Workers Involved in this Shared Learning exercise:

Name	Signature	Date