

HSE LIFE



The National Oil&Gas industry standard for professionals

Lessons Learned

Maintenance Starting fire

Workforce handout

The incident **STARTING FIRE** IN TURBO EXPANDER HOUSING

- Introduction
- The incident
- Result of Analysis
- My role and My commitment

Introduction

Handout for people that **work on the site**

The incident described in the video was thoroughly investigated.

From the analysis it was clear that Safety starts in the office, but it doesn't stop there!

People working in the office, your supervisor, all play a key role in preventing incident, but...

You yourself are the last line of defense in preventing incident and/or getting hurt!

Before the work starts always check and double check for potential hazards at the workplace. Think about what might go wrong. Think carefully whether you've taken all the precautions. Think about what to do in case of an emergency.

A Last Minute Risk Analysis (LMRA) is a good tool to use. Make sure you understand it fully and follow-up on agreed actions. You and your colleagues often know exactly what precautions need to be taken in order to control and manage the risks. Help and support each other. Your safety is the most important. Protect yourself and your colleagues.

When in doubt, stop the work!

LMRA Last Minute Risk Analysis

ASK YOURSELF THE FOLLOWING QUESTIONS:

- Do I know what I need to do?
- Is the workplace safe?
- Are all safety procedures explained to me?
- Am I familiar with the hazards of my work (assignment)?
- Do I have proper safety equipment (PPE)?
- Do I have the right tools?
- Are my tools certified?
- Have I done everything possible to minimise the risk?
- If anything goes wrong, do I know what I'm supposed to do?

All **YES**: start (or continue) the activity.

If **NO** or in doubt: go to your supervisor and discuss the situation.

From this engagement activity choose a topic and make it a personal commitment to prevent Process Safety incident. **It might just save your own or somebody else's life!**

HSElife UNIO offers a number of interactive training and refresher courses, such as PtW, TRA, LMRA, etc. You can visit HSElife UNIO by going to **hselifeunio.com** or scanning the QR-code on the right.



Introduction

Work safely or don't work at all

There are strict procedures when working on installations and systems. After all, there's a risk for noxious substances to be released. Therefore read the Permit to Work carefully and check if the described control measures have been taken. Then take the precautionary measures which belong to your job.

The incident

There was a starting fire in a Turbo Expander Housing.

A gas processing facility is shut down in order to replace a malfunctioning Pressure Safety Valve on the inlet separator. After having replaced the Pressure Safety Valve, production is resumed. After a second shutdown the starting up of operations is impeded by a High Level Alarm on the lube oil buffer/expansion vessel of the lubrication system of the Turbo Expander. In order to deal with the High Level Alarm an operator goes to the Turbo Expander Housing to manually drain the lube oil buffer/expansion vessel. The fire in the Turbo Expander Housing occurred during draining.



Figure 2: Impression of TE housing after the incident

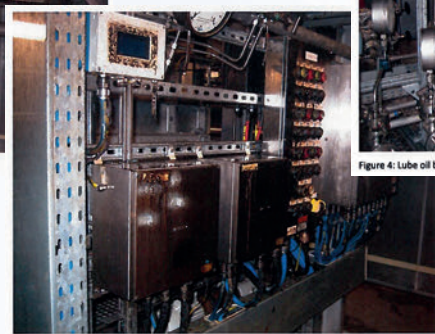


Figure 3: Damaged Junction Boxes/Control Panel

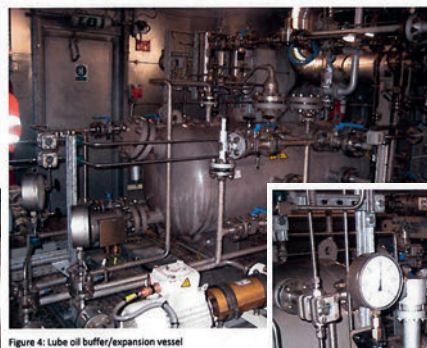


Figure 4: Lube oil buffer/expansion vessel



Figure 5: Location of manual drain point (Lube oil buffer/expansion vessel)

Result of analysis

Immediate causes

- The fire is most likely started by ignition of hydrocarbon vapours.
- The vapours came from the substance that was being drained from the oil vessel.
- The substance contained heavier hydrocarbons collected as liquids.
- Ignition was the result of static electricity generated during drainage.

Contributory factors

Migration of hydrocarbons

When the Turbo Expander is not running the lube oil pump and seal gas is stopped, process gas can migrate into the lube oil system. The high level in the oil vessel indicates that migration of heavier hydrocarbons in the oil system had taken place.

The level reached was outside operating limits.

No additional measures

It is possible that two shutdowns short after each other can result in relatively more migration due to stopping of the lube oil pump and pressure being rebuilt from the gas processing side. There was no exact information about the amount of migration.

The possibility of propane and butane migrating and collecting in a liquid stage in the system/process was not foreseen. The operator was not triggered to take additional measures for draining oil containing hydrocarbons.

Static electricity generated during drainage

Draining substance from a pressurized system to atmosphere can result in static electricity if done with a certain velocity of the liquid stream. It can be assumed that static electricity was generated during the drainage of substance from the oil tank. The combination of a volatile substance, static electricity and oxygen resulted in a fire.

Do you understand your role in preventing incidents?

My Name

My Function

My Commitment

I will...

Date