LEARNING FROM TANK OVERFILLING INCIDENT AT MOL GROUP

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PSM expert

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AGENDA


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About Me

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Slogan

May the **Safety** Be With You

Workplace

MOL plc.
DS Production
Process Safety Management

Education

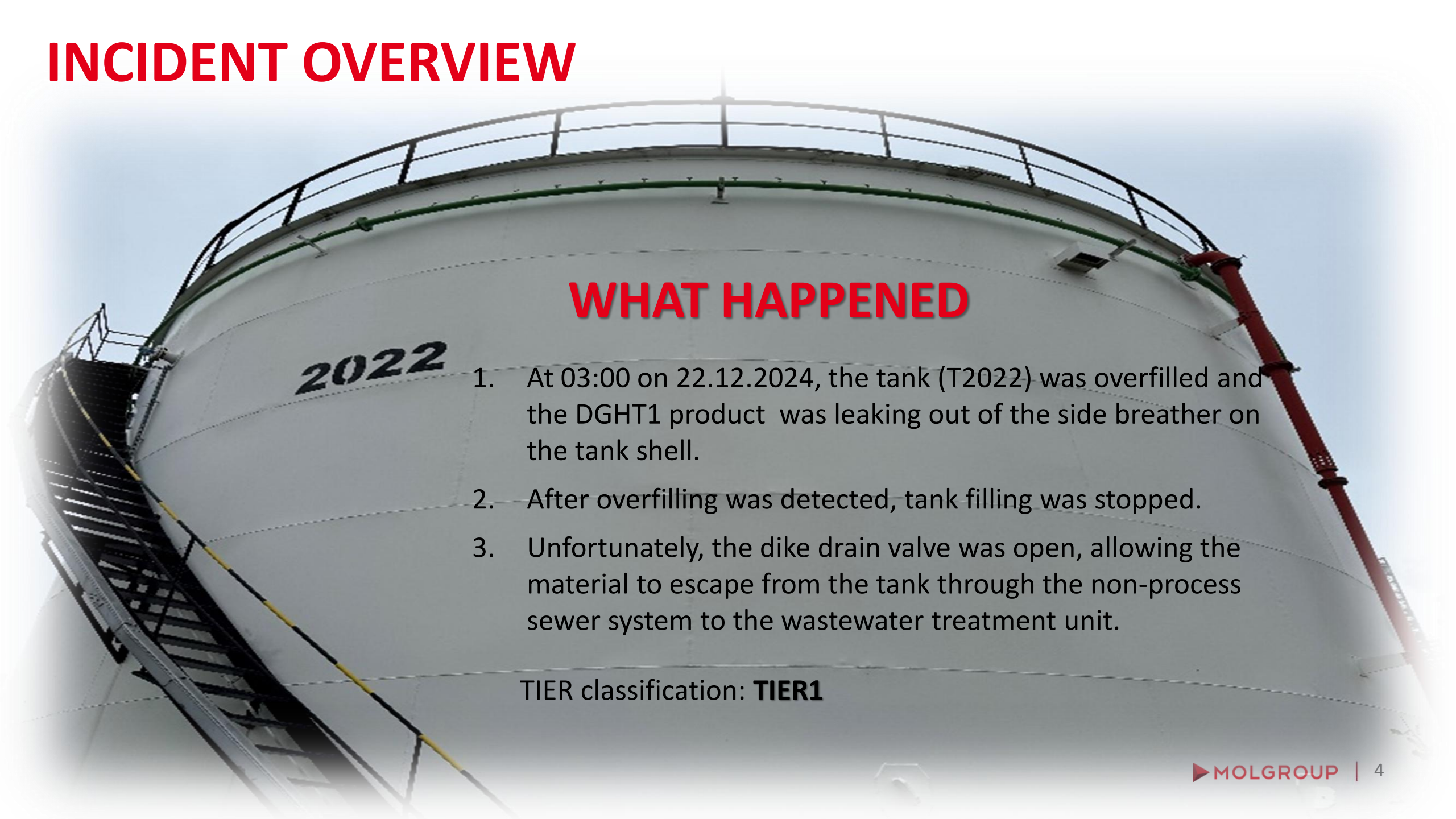
Chemical engineer
Corrosion Protection Engineer
Internal auditor

Work experience

25 years experience

- 10 years in Operation
- 15 years in Process Safety Management

INCIDENT OVERVIEW



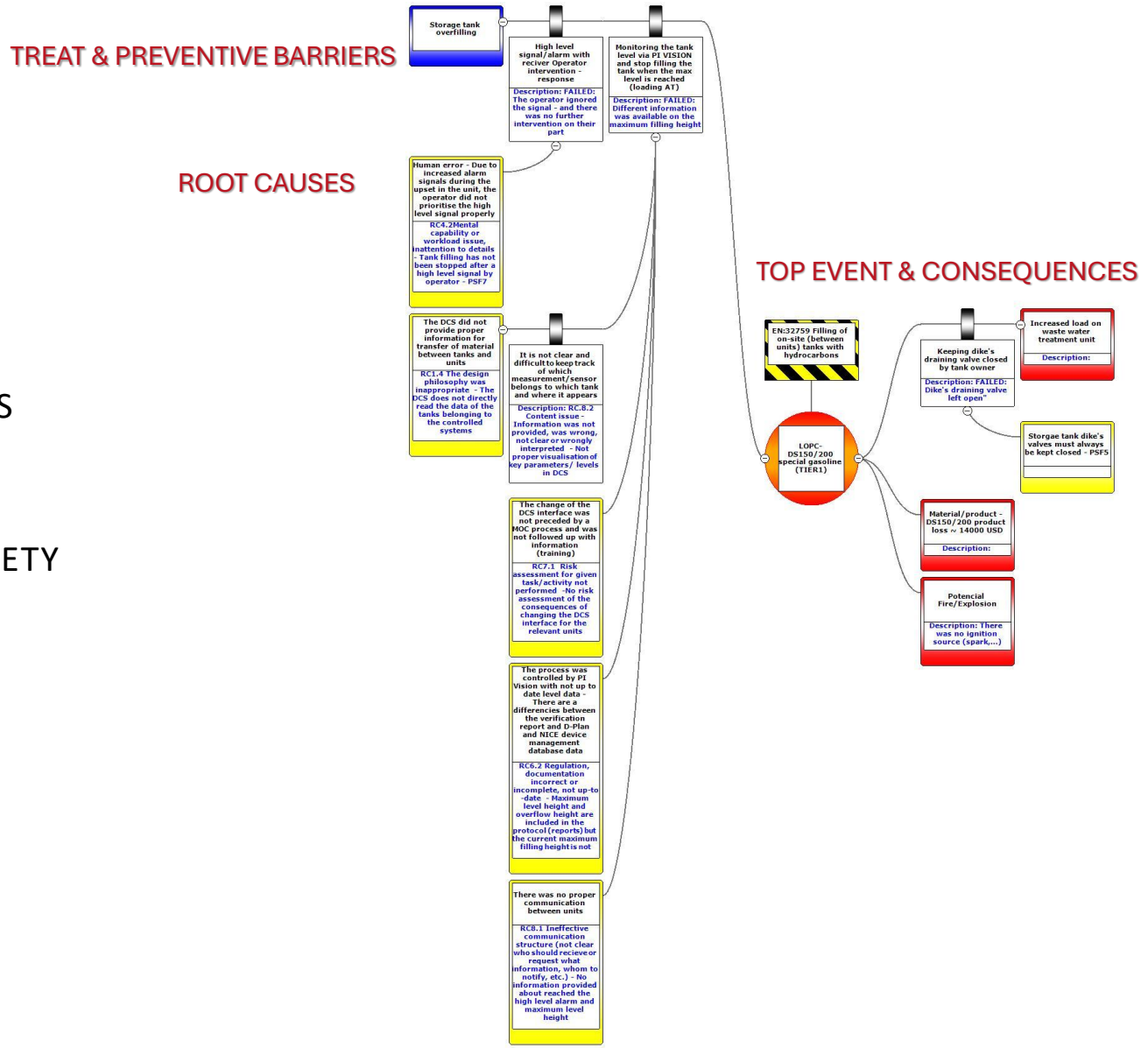
WHAT HAPPENED

1. At 03:00 on 22.12.2024, the tank (T2022) was overfilled and the DGHT1 product was leaking out of the side breather on the tank shell.
2. After overfilling was detected, tank filling was stopped.
3. Unfortunately, the dike drain valve was open, allowing the material to escape from the tank through the non-process sewer system to the wastewater treatment unit.

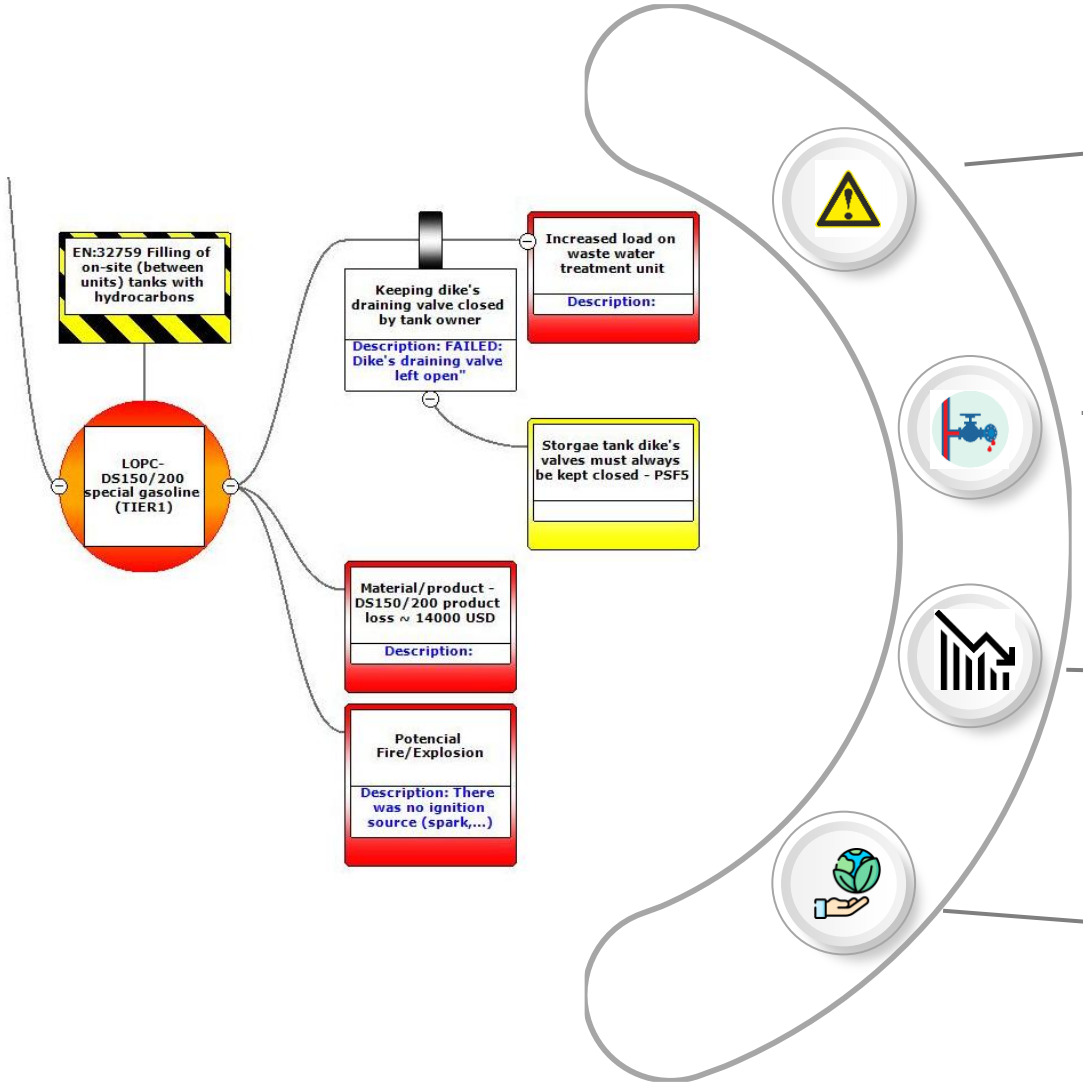
TIER classification: **TIER1**

BOWTIE FOR INCIDENT VISUALIZATION

- MAP OUT THE FULL PICTURE OF AN INCIDENT
- CLEAR COMMUNICATION: SHOWS HOW THE INCIDENT HAPPENED OR COULD HAPPEN
- ROOT CAUSE ANALYSIS: HELPS IDENTIFY WHICH BARRIERS FAILED OR WERE MISSING.
- RISK AWARENESS: HIGHLIGHTS WEAK POINTS IN THE SAFETY SYSTEM.



HAZARD, TOP EVENT AND CONSEQUENCES



01 **HYDROCARBONS**

Hazard: the source of the risk

02 **MATERIAL RELEASE**

Top Event: The point where control is lost

03 **MATERIAL &PRODUCT LOSS**

Consequences: Outcomes if the top event happens

04 **ENVIROMENT**

Consequences: Outcomes if the top event happens

THREATS & PREVENTIVE BARRIERS

BARRIER 01

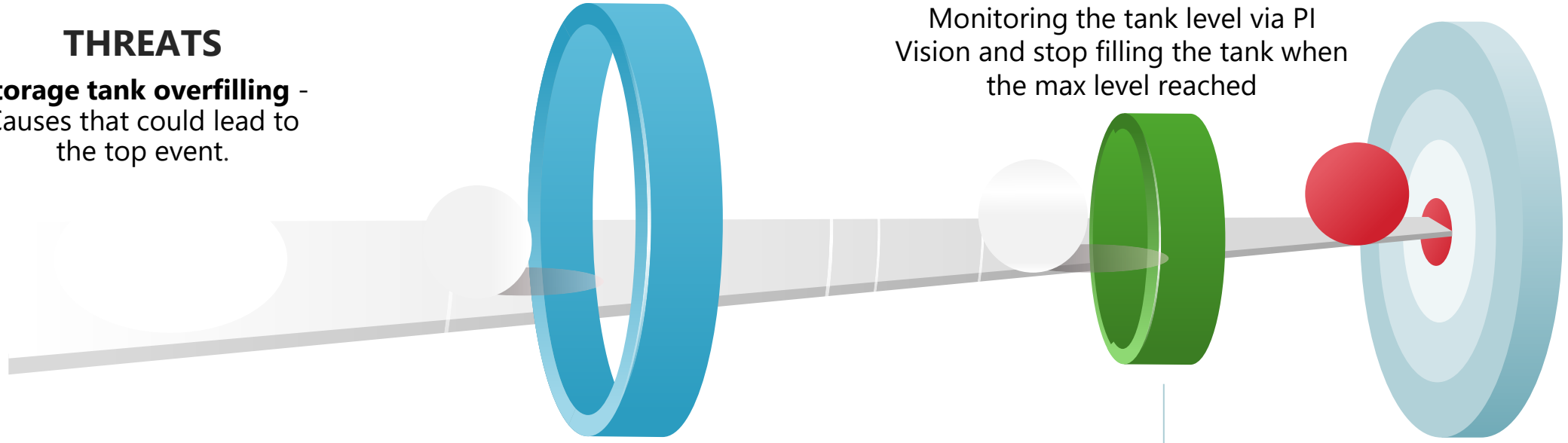
High level signal/alarm with receiver
Operator Intervention - response

BARRIER 02

Monitoring the tank level via PI Vision and stop filling the tank when the max level reached

THREATS

Storage tank overfilling - Causes that could lead to the top event.



PRIMARY CAUSE 01

FAILED: The Operator ignored the signal, and there was no further intervention on their partner

PRIMARY CAUSE 02

FAILED: Different information was available on the maximum filling height

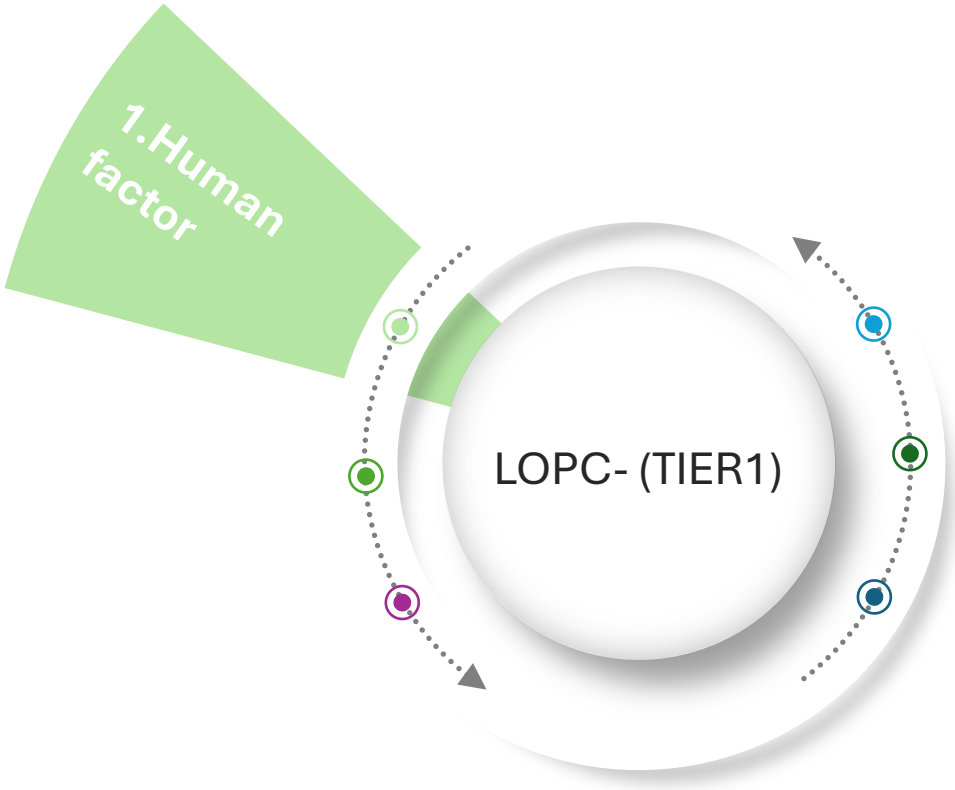
Top event

Material release

ROOT CAUSES

Human factor –
Due to increased alarm signals during the upset in the unit, the operator did not prioritise the high level signal properly

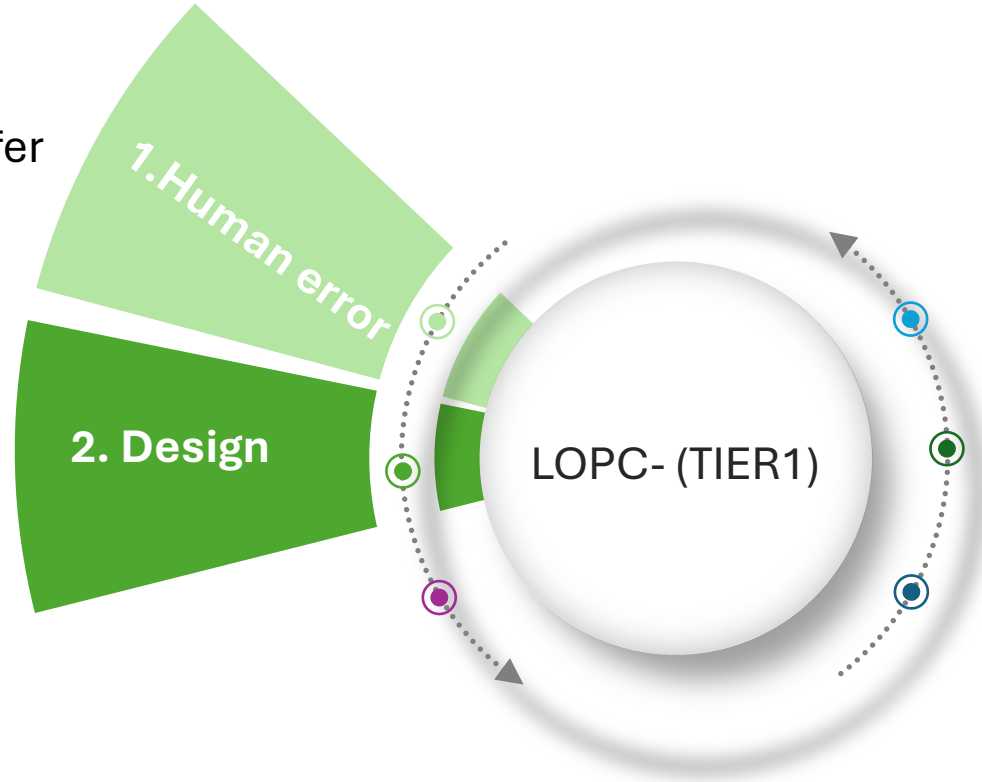
Root cause -
Workload issue, inattention to details - Tank filling has not been stopped after a high level signal by operator - PSF7



ROOT CAUSES

Design –
The DCS did not provide proper information for transfer of material between tanks and units

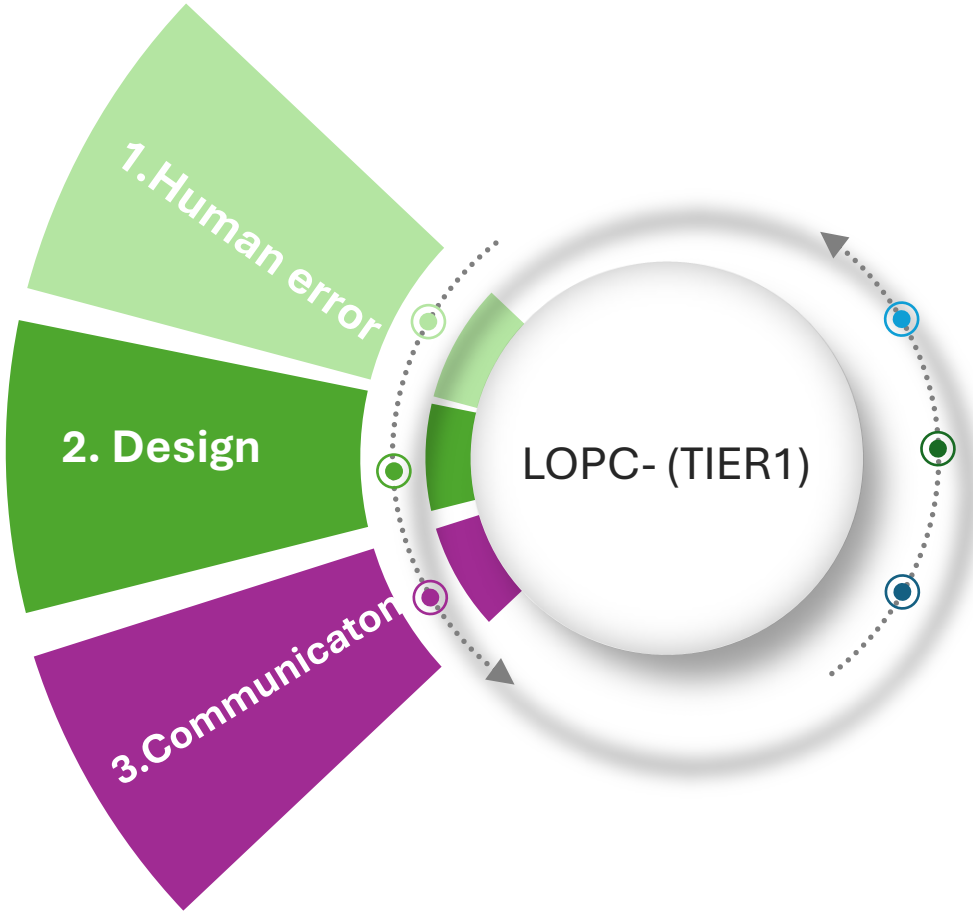
Root cause -
The design philosophy was inappropriate - The DCS does not directly read the data of the tanks belonging to the controlled systems



ROOT CAUSES

Communication – Information
It is not clear and difficult to keep track of which measurement/sensor belongs to which tank and where it appears

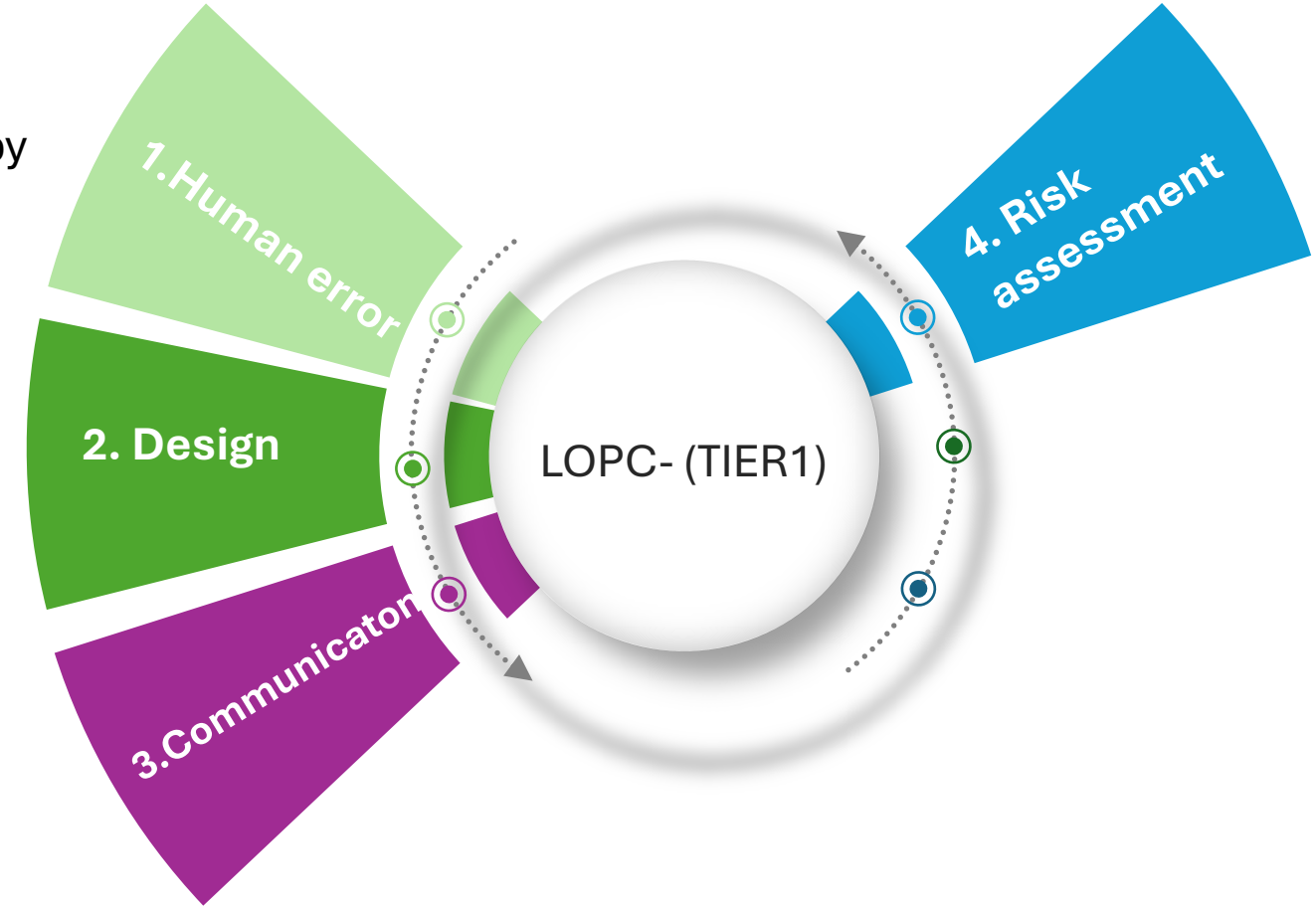
Root cause -
Content issue - Information was not provided, was wrong, not clear or wrongly interpreted - Not proper visualization of key parameters/ tank levels on DCS



ROOT CAUSES

Risk assessement –
The change of the DCS interface was not preceded by a MOC process and was not followed up with information (training)

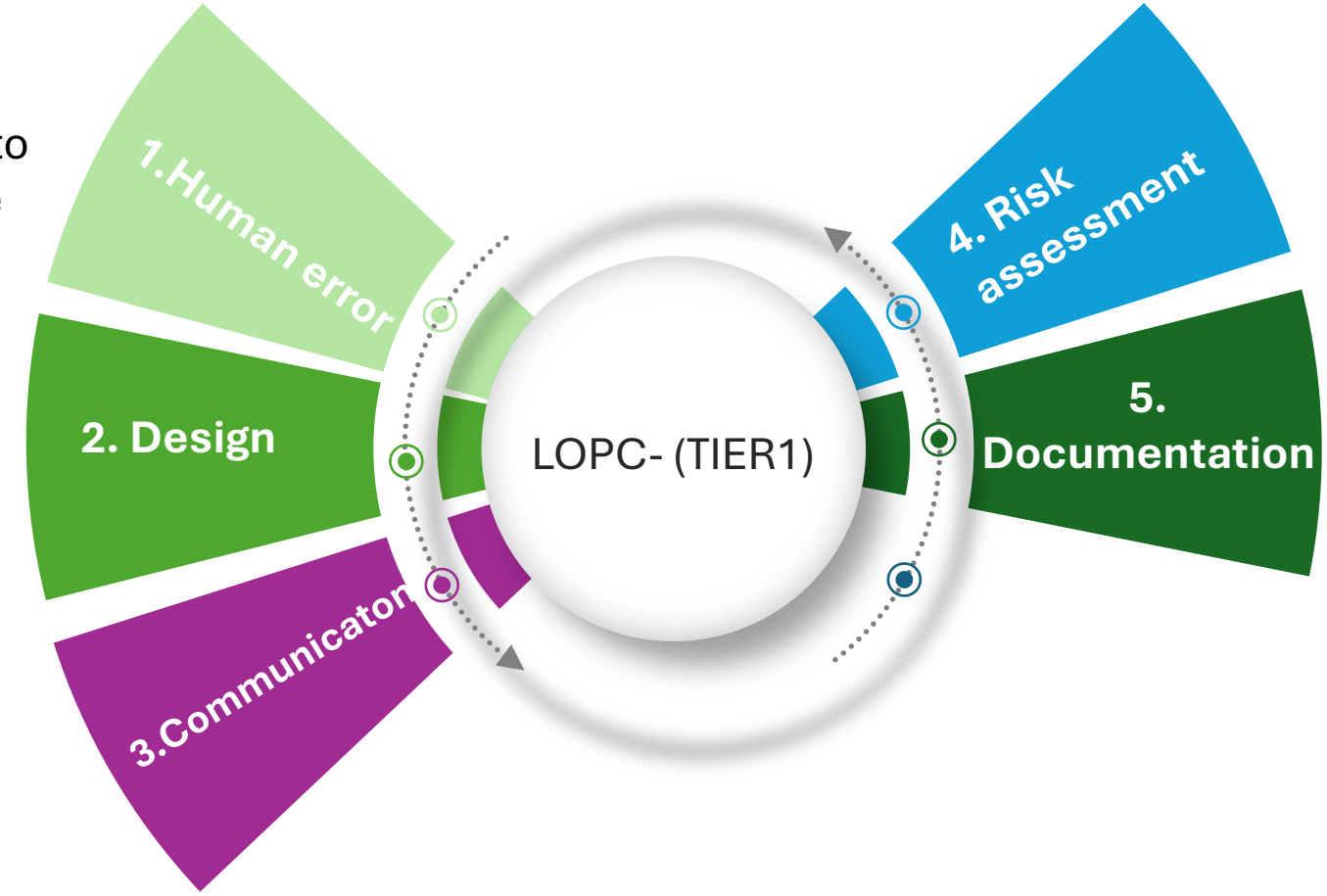
Root cause -
Risk assessment for given task/activity not performed - No risk assessment of the consequences of changing the DCS interface for the relevant units



ROOT CAUSES

Rules, Regulations, Documentation –
The process was controlled by PI Vision with not up to date level data - There are a differences between the verification report ,D-Plan and NICE device management database data

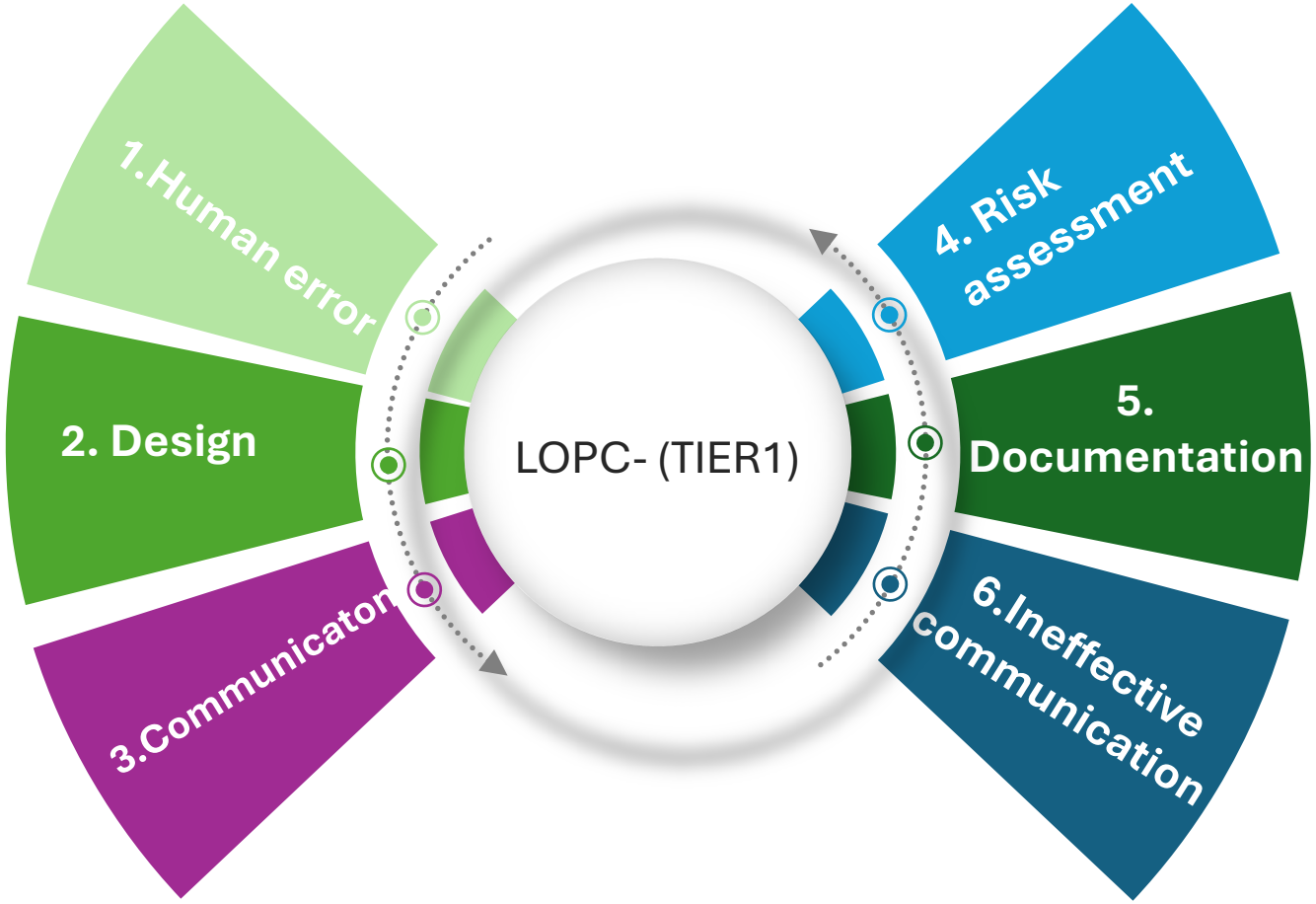
Root cause -
Regulation, documentation incorrect or incomplete, not up-to-date - Maximum level height and overflow height are included in the protocol (reports) but the current maximum filling height is not



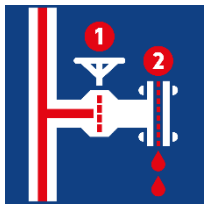
ROOT CAUSES

Ineffective communication structure –
There was no proper communication between units

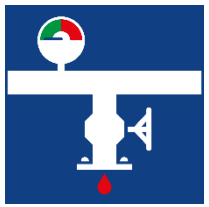
Root cause -
Ineffective communication structure (not clear who should receive or request what information, whom to notify, etc.) - No information provided about reached the high-level alarm and maximum level height



PROCESS SAFETY FUNDAMENTALS



1. Proper equipment isolation



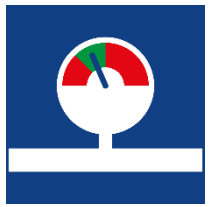
2. Safe Opening of Equipment

3. Monitor an open drain

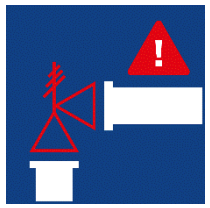
4. Manage overrides of safety critical systems

5. Walk the Line

6. Verify the condition of flexible hoses



7. Operate within safe limits

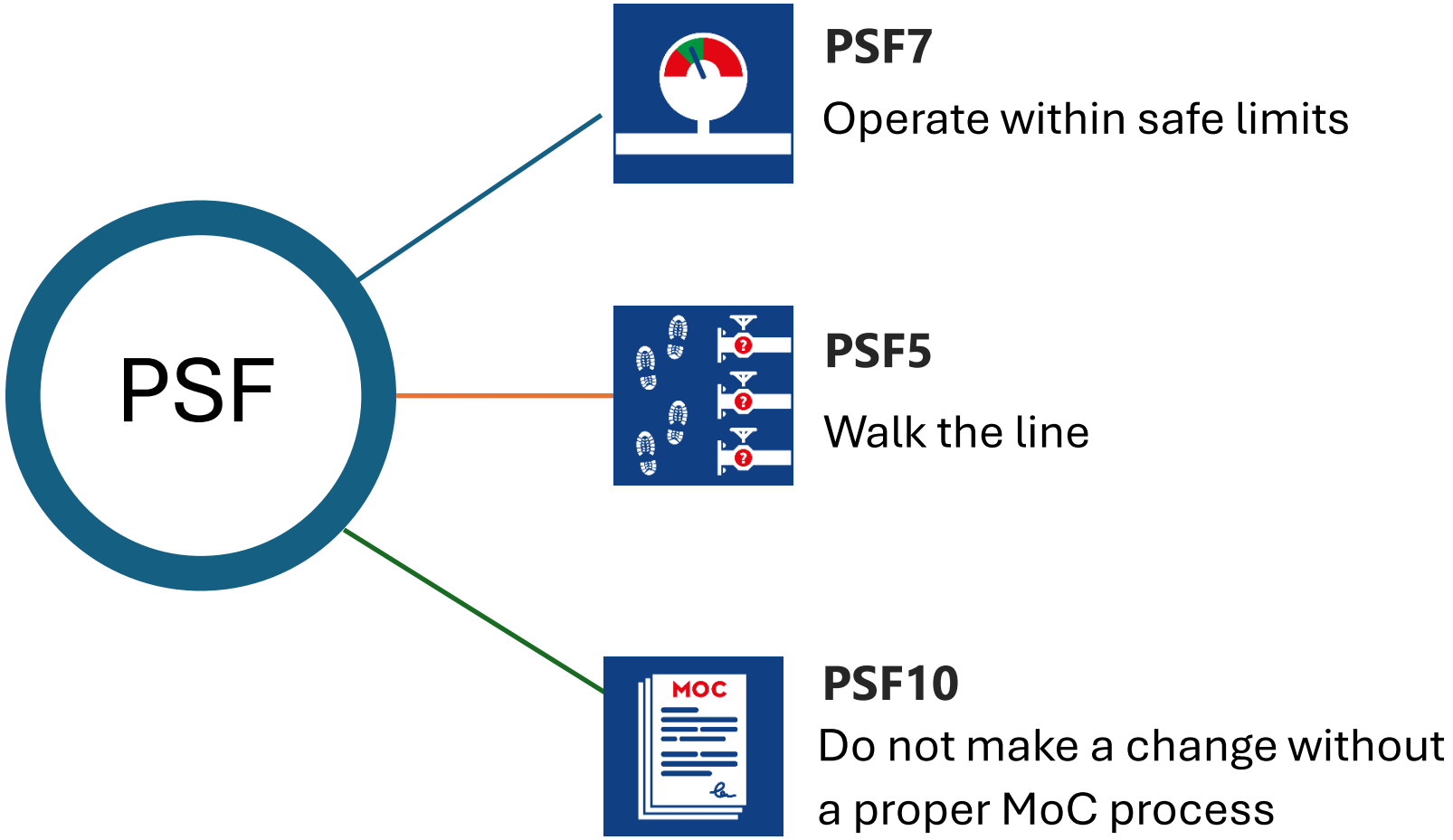


8. Identify Safety Critical Equipment (SCE)

9. Ensure safe atmosphere in fire box before igniting the burners

10. Do not make a change without a proper MoC process

FINDINGS – PROCESS SAFETY FUNDAMENTAL RELEVANCE

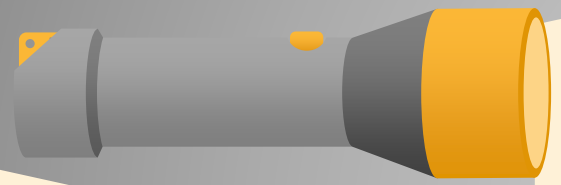


The filling of the tank has not been stopped after the high-level alarm - Don't ignore the alarm signals, as they warn you of danger!

The dike's drain valve was open and this was not checked by the tank owner or the loading unit that initiated the tank filling
- Always verify all material flow paths before starting any operation

The change of the DCS interface was not preceded by a MOC process and was not followed up with information (training)
Share the relevant information with all concerned!

SAFETY VIDEO CONCEPT

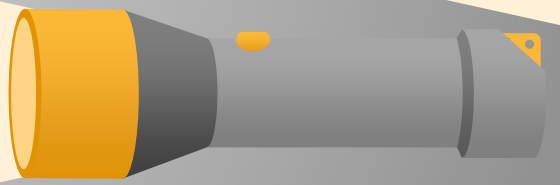


01

It is essential not only to **establish P**rocess **S**afety **F**undamentals but also to **communicate them effectively** and ensure they reach every employee

We want the application of process safety rules to become a natural part of our daily work, and for every employee **to pay attention** to them instinctively. To support this, **we have created an educational video** series that presents these fundamentals in a playful, easy-to-digest format, **helping colleagues learn** and stay aware of process safety rules

02




MAY THE SAFETY BE WITH YOU…
MOLGROUP