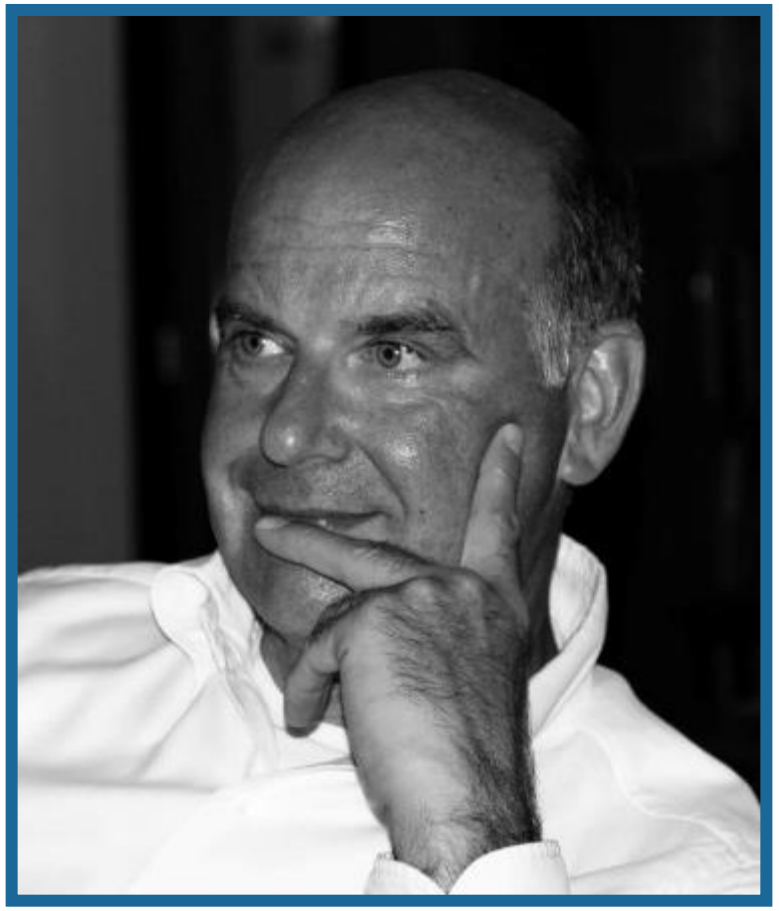
THE INDEPENDENT VOICE OF TRUST

Safety Data Requirements and Petrochemical Shipments
18 November 2021
Afternoon Session

Welcoming Remarks



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Safety Data Requirements and Petrochemical Shipments

Speakers

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Webinar objective

- Goal – to build a better, more coherent and aligned understanding in the stakeholder group of how Safety data is to be shared and communicated
  - Stakeholders in the process
  - Regulatory requirements
  - Best practice in communication

- Q&A Session

- Wrap up

Background

- Regulatory Requirements
  - Global requirements of GHS & CLP require effective communication of SDS information whenever substances are moved.
  - National laws, which do vary, but are largely well aligned with CLP and GHS require adequate communication of hazards. This includes limitations on exposure, the appropriate PPC etc
- Basic elements to bring awareness of hazards (and remediation in case of spills, fire etc) include
  - Correct labelling of all goods, including all small volumes with pictograms and text in the accepted format and using international codes
  - SDS must accompany all volumes as they are moved

Common issues (1)

- SDS not supplied at all, even after a request is made.
  - Comments such as " *can't you just find one on the internet or use one from somebody else*"
  - " *You are the experts, why haven't you got one already*"

    These are not only unacceptable, but against the law.

- SDS supplied but incorrect.
  - A key requirement of any SDS is that contact data, both routine and emergency, must form a part of the information.
  - Generic SDS's may not contain specific information with respect to packaging, additives etc.

Common issues (2)

- SDS supplied but not in the local language.
  - It is a basic requirement that SDS information be supplied in a language that those who have reason to use it can understand.
- SDS supplied but labelling does not match the SDS and / or local requirement.

Common issues (3)

- Fragmentation in administration
  - SDS communication often falls into the cracks between departments
    - Is it a job for
      - Procurement staff
      - Technical staff
      - Logistics staff
      - Trading staff
      - Terminals
    - The big questions are
      - Who knows what to do?
      - Who is authorised and responsible for doing it ?

- Do stakeholders ask ?
  - How often do TIC members write and ask for SDS ?
    - If you don't ask you too are deficient
    - Not asking on a routine basis establishes and reinforces bad habits – even in law you may be establishing a damaging pattern.
    - How aware are your staff of the link between hazards that are unquantified and SWA ?

Which SDS info is reliable?

TIC COUNCIL

15 REGULATORY INFORMATION

15.1 Risk symbols

15.2 Risk Phrases: Not Allocated

15.3 Safe Phrases: Not allocated

15.4 Warning Statements: Not allocated

15.5 Safe Directions: Not allocated

15.6 Standard Statements: Not allocated

Disclaimer: The information presented herein has been compiled from sources considered to be dependable and is accurate to the best of the industry knowledge and experience. However, it is up to the manufacturer / seller to ensure that the information contained in the MSDS is relevant to the product manufactured / handled. The industry assumes no responsibility for injury to the recipient or to third persons or for any damage to any property.

3.3 Health Hazards Acute Effects:

Swallowed: Non-toxic, However excessive ingestion of liquid can cause gastric distress a
mild diarrgoea

Eye: May cause mild irritation

Skin: Non-toxic. There have been no reported incidences, or other evendence of allergy
dermal irration through topical application in 15+ years of use.

Inhalation: May be harmful.

Chronic Effects: None identified

Mutagenic Effects: None identified

Reproductive Effects: None identified

Carcinogenic Effects: None identified.

Sensitisation: None identified

Infectious: Not applicable

Other Effects Combustion Products are harmful if inhaled and can irritate the eyes &
respiratory system. Contact with heated material may result in burns.

4 HAZARDS IDENTIFICATION

CNSL causes serious eye damage, is harmful if swallowed, is harmful in contact with skin, is harmful to aquatic life, causes skin irritation and may cause an allergic skin reaction.

The dangerous assumption (Example 1)

Most food related substances are assumed to be very safe. This isn't always the case.

Cashew Nut Shell Liquid, and economically important liquid, is traded in reasonable volumes.

Given the common experience of cashew nuts as a foodstuff the assumption, if not prompted by a proactive communication, of many, would be to assume that any cashew related product was safe to handle.

The dangerous assumption (2) Example 1

INCIDENT

A client sent a sample to a member's laboratory. The bottle did not have sufficient ullage space and was contaminated with product on the outside.

No hazard pictograms were affixed.

Hazardous properties could not be identified. The lab had No familiarity with CNSL and the SD had not been communicated at all. Post factum availability showed many hazards were not identified.

While standing in front of a lab bench the technician placed a platinum cup on the balance and then shook the product for homogeneity. As there was product on the outside of the bottle which limited grip.

The dangerous assumption (3) Example 1

As a result, the bottle fell on the ground while shaking. This in turn resulted in product splashing on her hand and wrist. (And, determined only the following day, also on the jeans of the technician.)

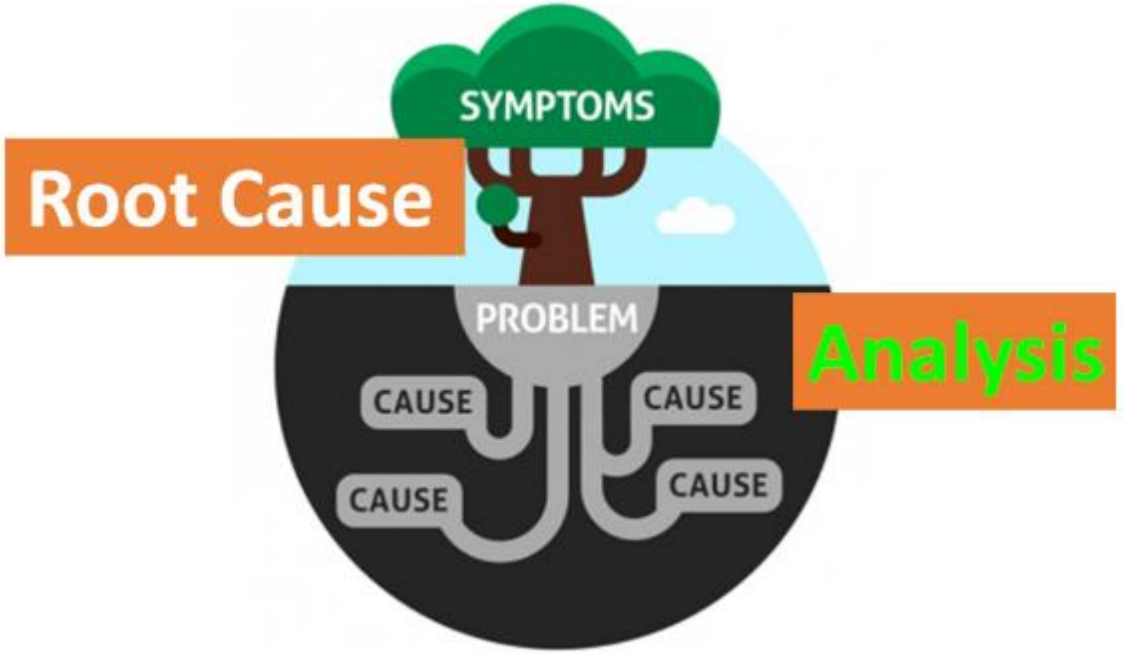
The lab technician directly washed the contaminated skin with water and soap. After cleaning up the spill she continued to work.

The next day some small irritations spots (blisters) appeared on both upper legs. Apparently, the liquid had soaked through the jeans, dripping on the upper legs, without her realizing this. If so, the jeans would have been removed and the skin could have been rinsed too..

The dangerous assumption (4) (Example 1)

Root Cause and lessons learned

1) New substances are entering the industry, so be aware and ask. – *Even when something "sounds" innocuous, and " food like " it can be hazardous* !
2) Despite the product presenting a hazard, and there being a regulatory duty to communicate this, the client had failed to do so.
3) Despite the lab not being familiar with the substance, they had assumed it to be safe and not asked for SDS.
4) Because the lab was not familiar with the substance the first aid was insufficient (PEG should have been to hand)
5) Always ask for SDS when a new substance is encountered



The dangerous assumption (1) Example 2

On 28 September 2019, a cargo tank containing styrene monomer on board the Cayman Islands registered chemical tanker *Stolt Groenland* ruptured causing an explosion and fire.

The tanker was moored alongside a general cargo berth in Ulsan, Republic of Korea and the Singapore registered chemical tanker *Bow Dalian* was moored outboard.

The ignition of the styrene monomer vapour resulted in a fireball, which reached the road bridge above. Both vessels were damaged, and two crew suffered minor injuries. Fifteen emergency responders were injured during the fire-fighting, which lasted for over 6 hours.

Forewarned is forearmed

An accident occurred when an inspector was moving 25 kg Bags of an additive called B.H.T.(Butylated hydroxytoluene) on the deck of a Ship. The accident was a back strain caused by the manual handling of three metric tonnes of the material, however during the subsequent safety investigation the MSDS for the material was examined

It transpired that the MSDS had been retrieved in retrospect from the internet, from a company site that was different to that of the supplier . The MSDS showed the GHIS symbol indicating hazardous to the environment, but closer examination indicated there were associated Short Term Exposure Limits (STEL) and Time Weighted average (TWA) limits. On further investigation the CAS (Chemical Abstract Service) card identified it as,
"a Harmful Substance with the risk phrases indicating hazardous if swallowed, and irritating to the eyes, skin and respiratory system."

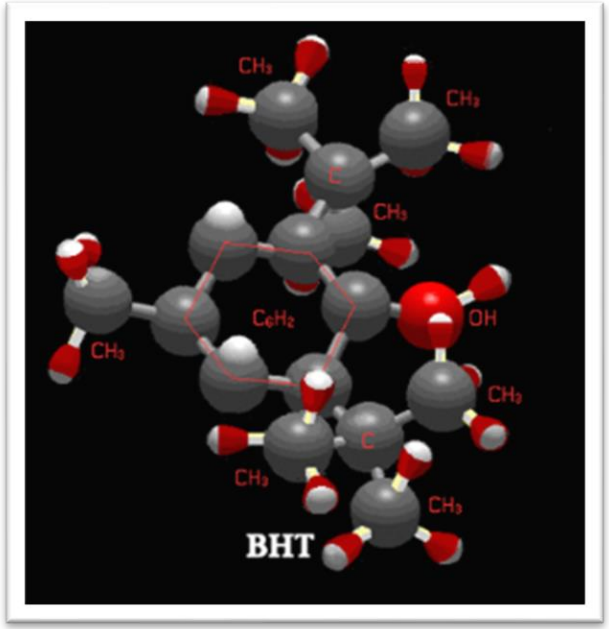
Forewarned is forearmed

The associated Safety Phrases were: *“ in case of contact with eyes, rinse immediately with plenty of water and seek medical advice, and wear suitable protective clothing, gloves and eye/face protection.”*

All the above would have been useful to know on job acceptance, to indicate the level of personal protection necessary. The assumption from the GHIS symbol it was not hazardous to humans, so the neccessary PPE requirement had not been evaluated.

It is unfair to assume that operational people in distant offices have the requisite knowledge to handle materials correctly without having the information directly to hand.

It is also worth bearing in mind that should there be an adverse exposure requiring emergency treatment, the MSDS contains vital information for medical professionals.



Questions?

Please submit your questions in the Webex Q&A Box

Wrap Up

- Let's work together, with all of the other stakeholders, to use the SDS system to reach our common goal, that everyone goes home as well as they came to work every day.
- If you have any questions please email them to secretariat@tic-council.org
- Follow-up survey to be sent tomorrow
- Certificate of Attendance to be mailed

Look out for the survey that will be sent via email following the webinar!

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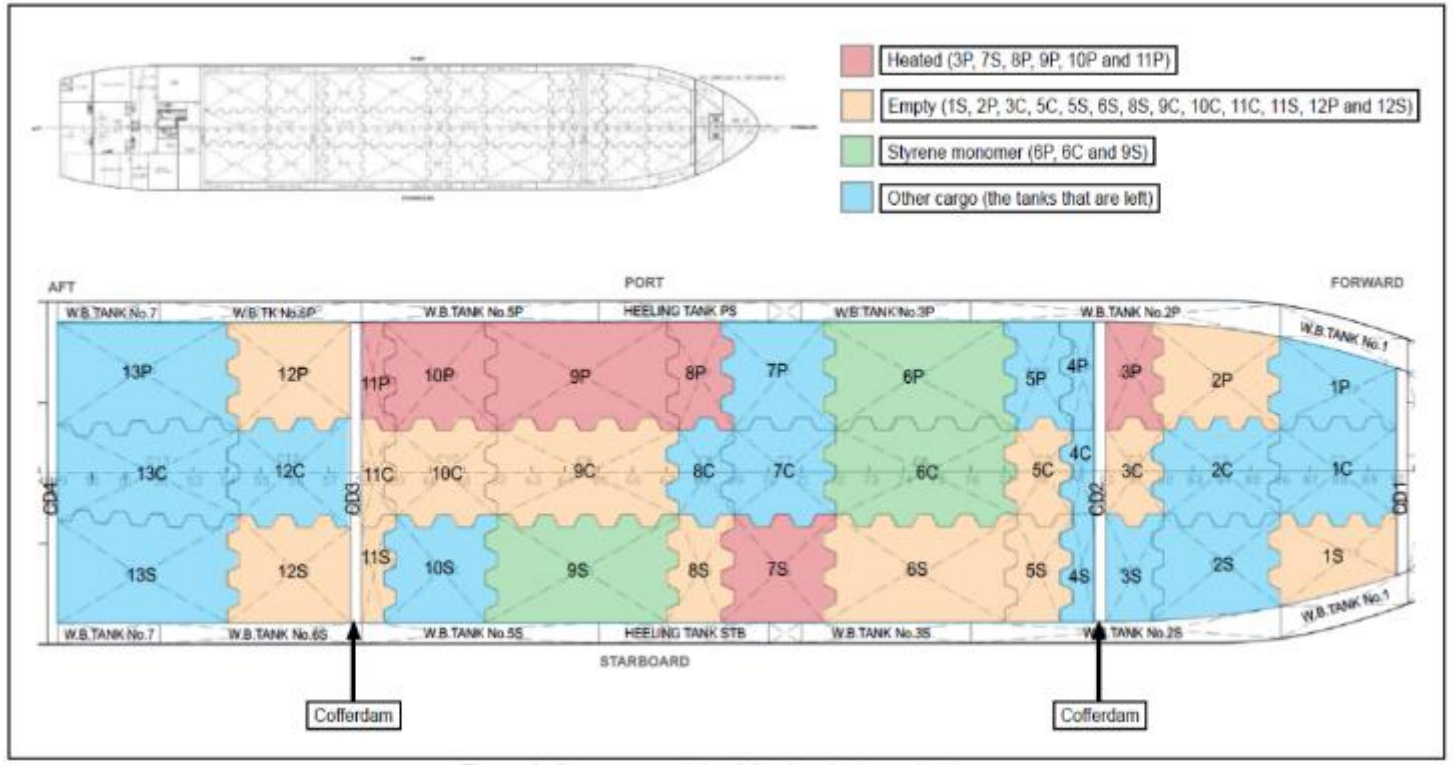
The dangerous assumption (2) Example 2

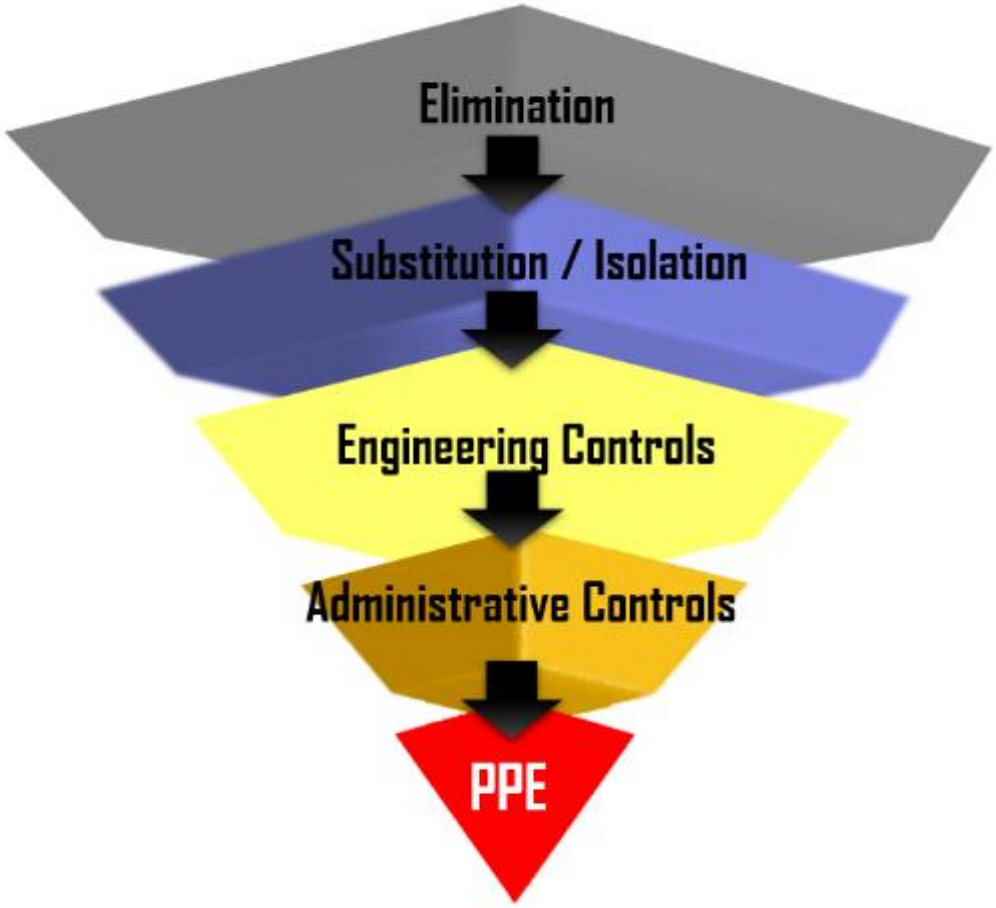
The rupture of the styrene monomer tank resulted from a runaway polymerisation that was initiated by elevated temperatures caused by heat transfer from other chemical cargoes. The elevated temperatures caused the inhibitor, added to prevent the chemical's polymerisation during the voyage, to deplete more rapidly than expected. Although the styrene monomer had not been stowed directly adjacent to heated cargo, the potential for heat transfer through intermediate tanks was not fully appreciated or assessed



The dangerous assumption / Polymerisation (3) Example 2

To prevent polymerisation during storage and transportation, an inhibitor must be added. TBC, the most commonly used polymerisation inhibitor, is a solid but is often mixed with methanol to produce a liquid before adding to styrene monomer. In shore storage facilities, TBC is added to styrene monomer through dosing systems. For the marine transportation of styrene monomer in bulk, the TBC is added to the bottom of a cargo tank before loading. TBC should be stored in non-reactive, light resistant containers at ambient temperature. It is not known to have a limited shelf life.

The dangerous assumption (4)
Example 2

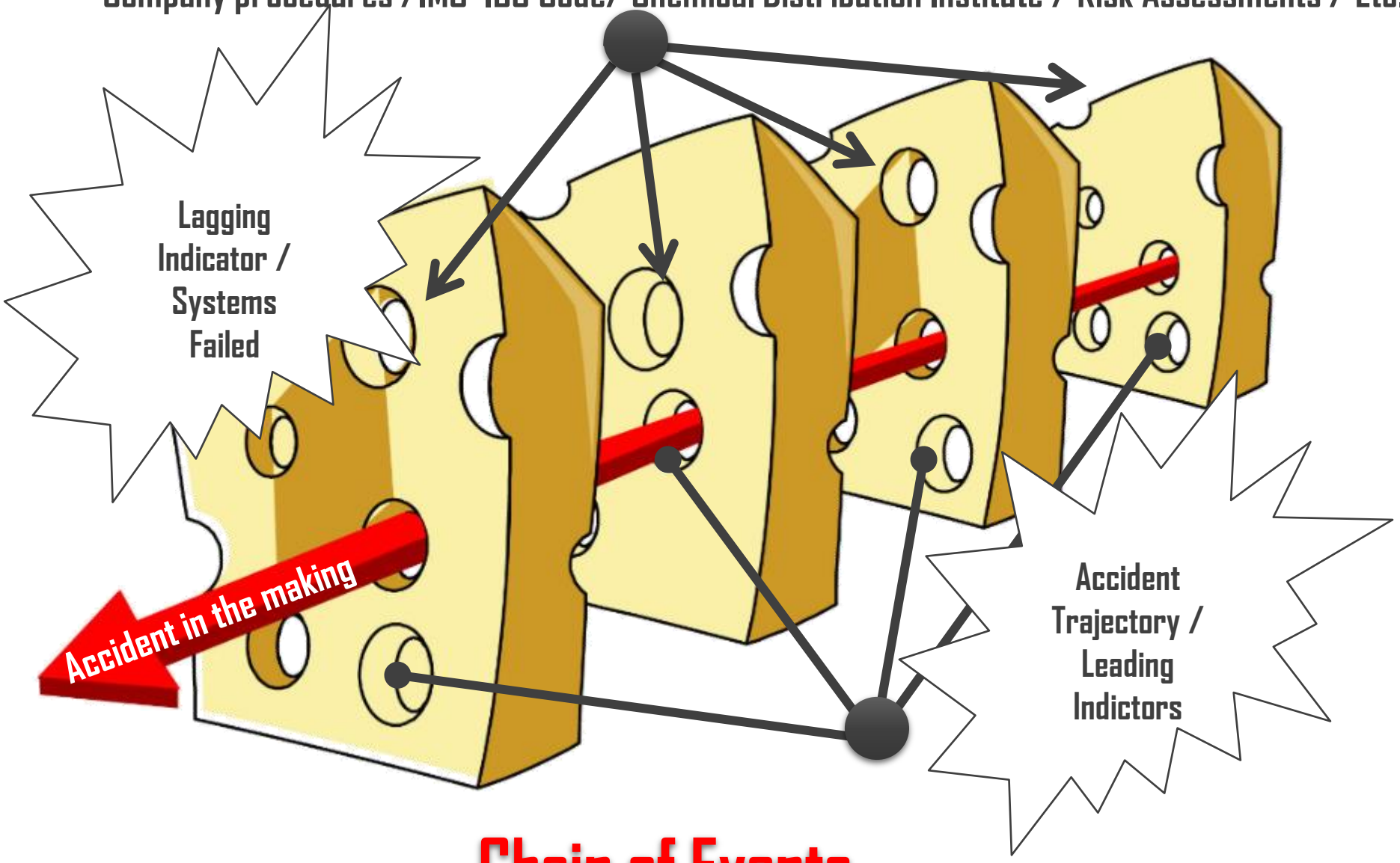


Root Cause and lessons learned (amongst others)

1) An impressive mix of hazardous products / inhibitors store in tanks.
2) Heat transfer from other cargoes
3) Runaway polymerisation
4) Not meeting segregation requirements as per the IBC code
5) No temperature monitoring
6) SDS do not consider consequences in relation to other cargoes caried on board
7) SDS must be of recent dates and consistent with actual chemical properties including blends, mixtures and solutions
8) SDS are the last line of defence in the HSE strategy
9) Must be included in every risk assessment and risk management system

Safety Controls / Barriers

Company procedures /IMO IBC Code/ Chemical Distribution Institute / Risk Assessments / Etc.



Chain of Events

Cargo + Inhibitors / Heat transfer / Polymerization / Voyage/ Journey / No temp control / Etc