

# Asset Integrity issues

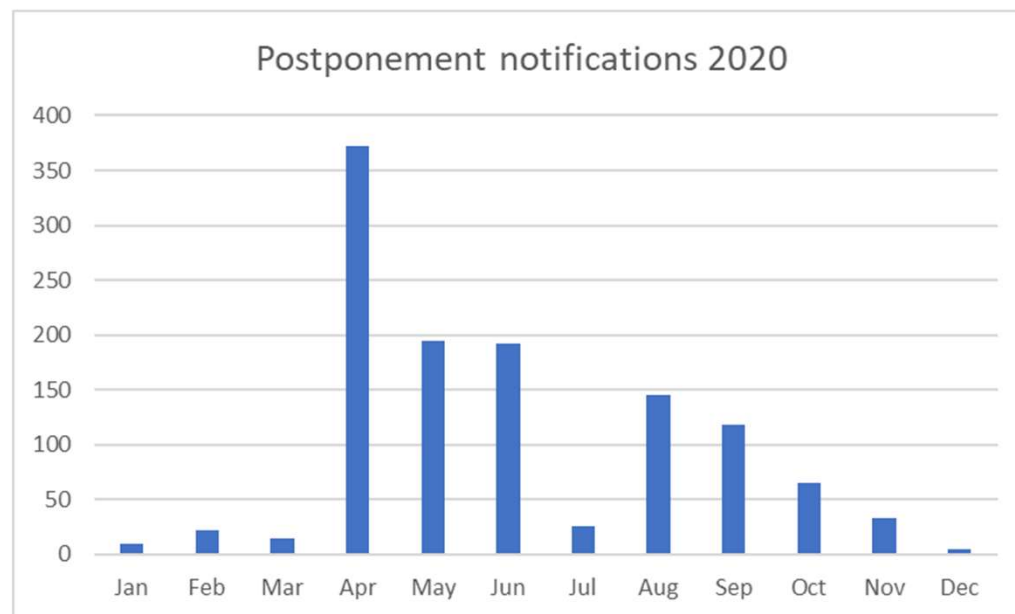
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# Leadership – kicking the can?



## COVID-19 impact

- Postponements levels were significant;
- A rush to postpone at the onset of restrictions;
- At least 40% are associated with a single third party inspection company
- Some evidence that postponements were economic, e.g., to next financial year
- How are you going to return to the status quo?



## Concerns, exacerbated by COVID?



- Increasing use of Non-Invasive approach to examination
  - Operators must ensure that the coverage and accuracy is at least as good, if not better;
  - Ask yourself ‘what am I missing?’
  - There is no scope to trade risk.
  - Always centred on a poor and selective Risk Based Inspection review
- Increasing use of ‘temporary’ piping repairs
  - Clamps and composite repairs;
  - HSE regards these as ‘Defined Life Repairs’, with a limited time span;
  - Plan for replacement, where fluid is hazardous, and especially so where deterioration is internal and hidden;
  - To use this technology, operators must improve their knowledge.

## Non-invasive inspection – Intelligent Customer



- Storage tank of phenol, built c.1977
- Lagged and steam heated, on an inadequate base;
- Insulation never removed in it's lifetime;
- RBI said non-invasive, and identified main threat from corroded holding down bolts;
- Didn't recognise CUI threat or under base corrosion;
- Last thorough inspection said bolts were in good order;
- There are no holding down bolts...

## Defined Life Repair issue – Intelligent Customer



- Repair of 16” stainless steel hazardous line
- ‘weep’ at weld;
- Following installation, the repair failed within days;
- Plant turned off.
- Problems with repair – hand preparation
- However, root cause was structural and an initial integrity issue.
- For Operators - established standard already exists, but further repair advice coming from Energy Institute

## Leadership issues – example



- Riveted tank c.1936, steam heated and insulated, hydrocarbon ‘slops’.
- Poor inspection history, Thorough exam due 2017. Not done for operational reasons.
- Risk assessment 2017, 2018, 2020 (days before HSE visit, by site manager alone)
- Improvement Notice issued to inspect, operator withdrew tank, and it won't be reinstated.

# Case Study – Norilsk Oil spill

May/June 2020: Fuel storage tank leak



# Case Study – Norilsk Oil spill

Up to 17,500 tonnes of diesel spilled on to the ground and into local rivers

## Causes

- Corrosion of tank bottom
- Collapse of foundations due to permafrost melting

Root causes will lie in the management system and leadership culture





# Learning from Buncefield

COMAH

Control of Major Accident Hazards

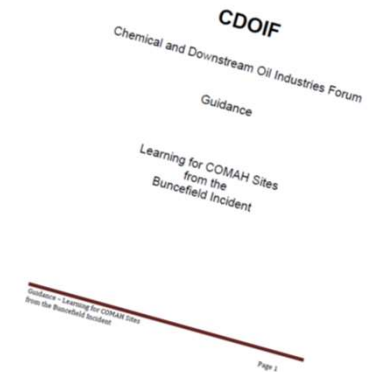
## Buncefield: Why did it happen?

The underlying causes of the explosion and fire at the Buncefield oil storage depot, Hemel Hempstead, Hertfordshire on 11 December 2005

Designers and suppliers should have adequate knowledge of the environments where their equipment will be used.

Bunds should be treated as safety critical equipment. They should be designed, built, operated, inspected and maintained to ensure that they remain fit for their containment purpose.

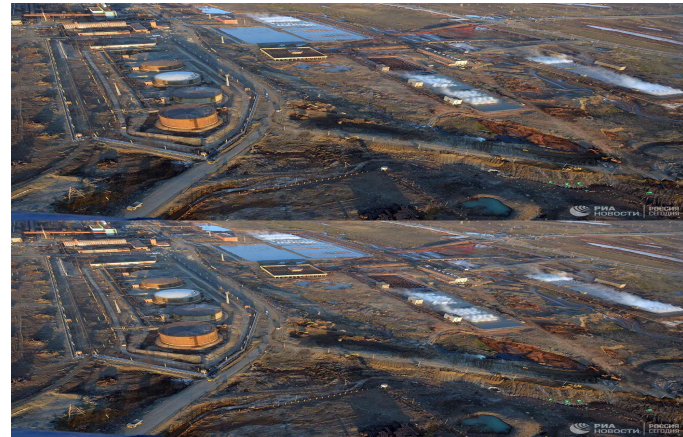
Where appropriate tertiary containment should be provided to ensure that in the event of a spillage of hazardous liquids, such as fuel or fire run-off water, these are contained and pollution is prevented.



# Managing containment systems as safety critical

## Maintaining asset integrity

- Avoiding physical degradation requires suitable and sufficient inspection and maintenance regimes
- Ensuring risks are ALARP requires periodic review of current good practice and upgrade SFAIRP; i.e. continual improvement



# Bulk storage tanks are particularly vulnerable to extreme weather / climate change impacts



Flooding

Wind



Lightning

Are you taking the measures necessary to understand and avoid catastrophic impacts caused by natural hazards (NaTechs)?