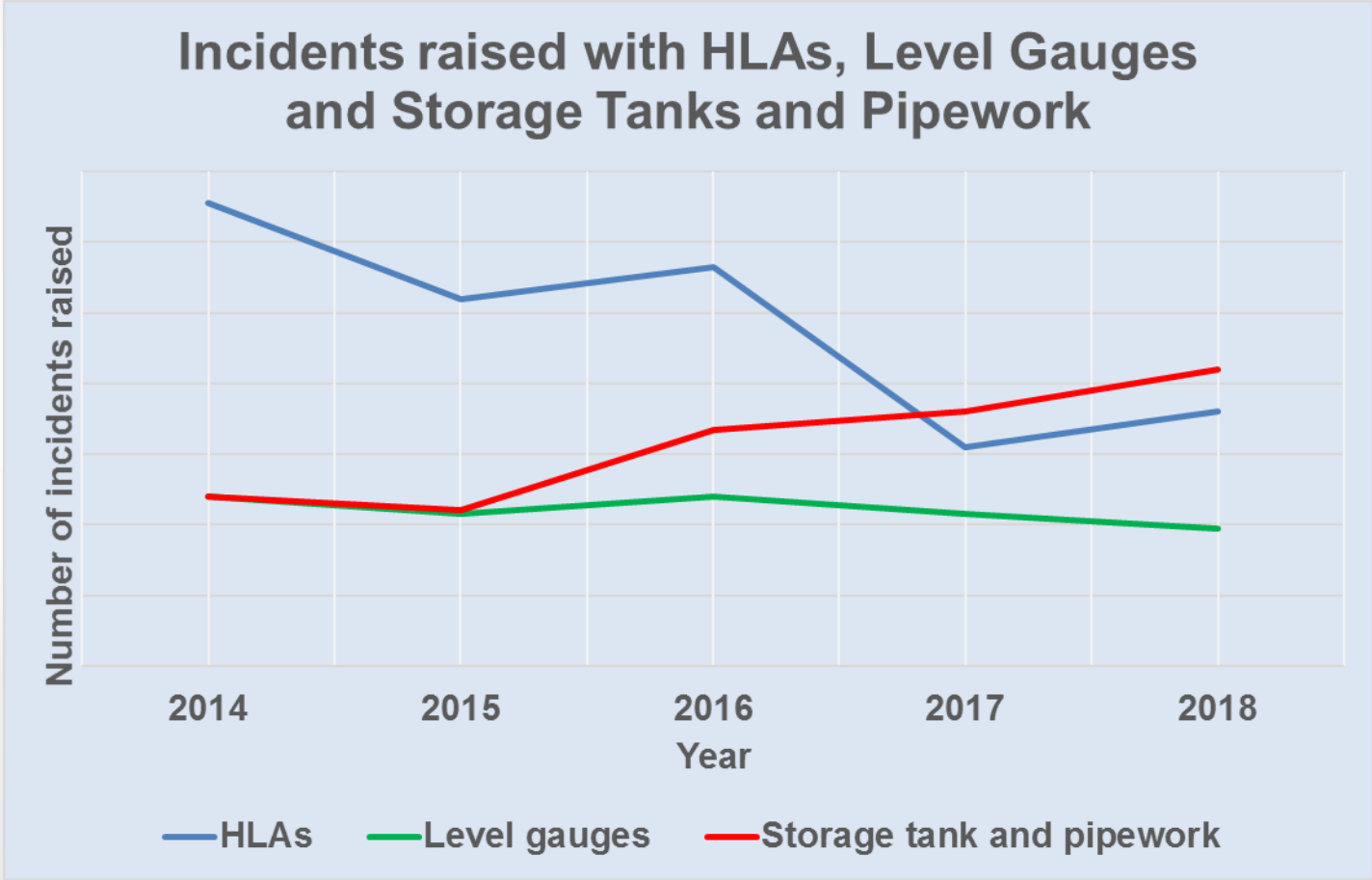
Trace Heating of Bitumen Pipelines

Eurobitume UK Reporting Trends 2014 to 2018

During the delivery of bitumen Eurobitume UK members have reported the following trends in the last 5 years:

- The number of incidents relating to:
  - HLA and HHLAs has fallen.
  - Level gauges are relatively flat.
  - Storage tanks and pipework has increased significantly.



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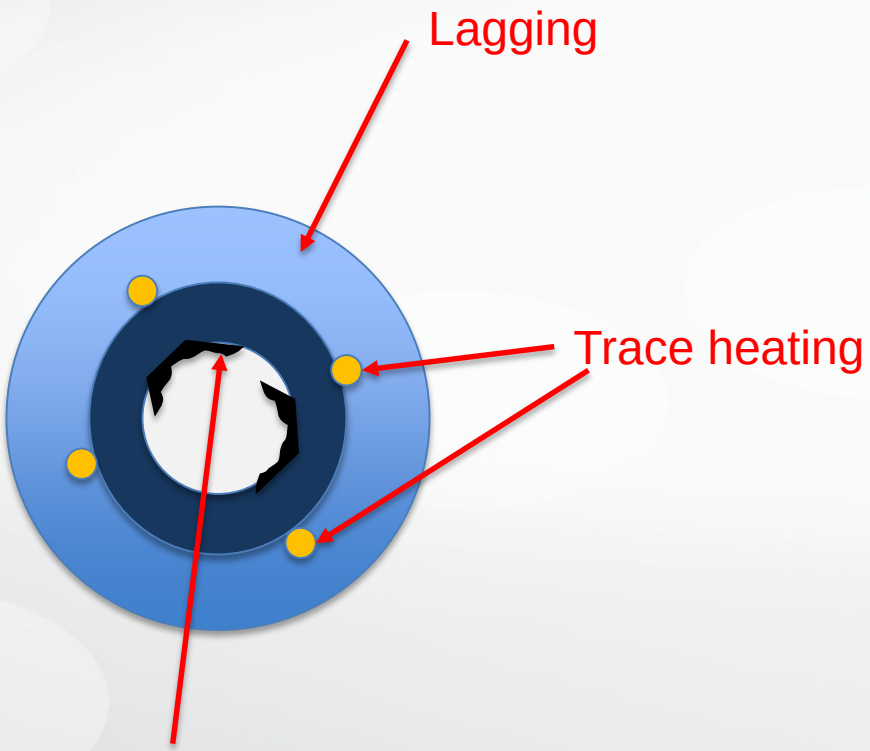
Pipework related issues



- Pipework can become blocked for several reasons, including:
  - Inadequate clearing of pipelines following a bitumen delivery.
  - Excessive thermal cooling of the bitumen due to very cold pipelines.
  - Overheating of pipelines causing carbon deposits and subsequently reducing internal diameter of the pipe.

Inadequate Clearing of Pipelines

- The clearing of the pipelines is the responsibility of the supplying bitumen company.
- Ensure the safe working capacity (SWC) is set so it leaves sufficient ullage before reaching the high level alarm (HLA). This will enable the delivery vehicle to clear the pipelines without triggering the alarm.

Excessive Thermal Cooling

- When the weather is cold, wet or windy bitumen pipelines can become very cold. As bitumen is delivered, it can shock cool in these cold spots and deposit bitumen around the internal circumference of the pipe.

- The following steps can be taken to avoid this situation arising:
  - Insulation along the full length of the pipeline.
  - Ensure the lagging is well secured to avoid wind chill under the lagging.
  - Controlled trace heating along the length of the pipeline (see slide 7 for more detail).

Overheating of pipework

- In an attempt to reduce the impact of thermal shock on the bitumen; trace heating is often applied to sections or preferably the whole length of the pipeline.

- If the trace heating is:
  - Set at too high a temperature the residual bitumen lining the pipe will oxidise resulting in carbon deposits.
  - Left on for prolonged periods, even at relatively low temperatures, again the residual bitumen lining the pipe can oxidise resulting in carbon deposits.

Optimising trace heating

- If trace heating is well controlled it will provide an extremely effective way to manage the free flow of bitumen within the pipework avoiding time consuming and expensive blockages.
- The trace heating should be:
  - Set around the minimum pumping temperature of the bitumen being delivered.
  - Timed to come on between 1 and 2 hours before the bitumen is delivered.
  - Timed to turn off approximately one hour after completion of the delivery.
- When implementing any new process a suitable and sufficient risk assessment should be carried out.

Bitumen Safety Documents

Guidance documents on a range of bitumen safety related subjects can be downloaded free from the Eurobitume website:

- UK Version of the 2018 Guide to Safe Delivery of Bitumen.
- Safety Showers
- Eurobitume Bitumen Burns Card
- Safety Footwear Risk Assessment for Bitumen Delivery Drivers
- Operational considerations for Hot Bitumen Storage Tanks and Off-loading Systems.
- Design and use of Ground Based Pumps (EBUK/MPA document).
- Safe Bitumen Tank Management (EBUK/MPA document).
- Returning Bitumen Storage Tanks to Service.

See also the Energy Institute Model Code of Safe Practice Part 11: Bitumen Safety Code

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Other Bitumen Toolbox Talks

The following toolbox talks can be downloaded free from the Eurobitume website:

- Bitumen Delivery Driver Induction
- Bitumen Discharge Permit
- Personal Protective Equipment
- Emergency Safety Showers
- Ground Based Pumps
- Blocked/Partially Blocked Pipelines
- Emergency Shutdown of Bitumen Delivery Vehicles
- ‘Pocket’ Guide to the Safe Delivery of Bitumen

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