LEARNING POINTS FROM EUROBITUME UK BITUMEN DELIVERY SAFETY DATA

BACK PRESSURE AND TRACE HEATING

Eurobitume UK is committed to working with the full supply chain to actively and continually improve the safety of bitumen related activities.

ISSUE:

One area of concern, highlighted by near misses reported during the delivery of bitumen, is the issue of back pressure generated during the bitumen transfer process. This dangerous situation can evidence itself as retained pressure in the system after loading is completed or increased time for off loading with the potential to create sprays and pressurised spills. In Q3 2017 a fine spray of bitumen occurred when a driver disconnected the flexible hose due to pressure in the delivery pipeline. No one was injured in this incident but it is clearly a very dangerous situation.

Nature of Near Miss	Year							
	2010	2011	2012	2013	2014	2015	2016	2017
Pipework blocked or partially blocked	10	15	5	21	28	18	26	29
Blocked or partly blocked vent pipe	0	4	0	0	3	4	5	11
Back pressure on completion of the delivery	0	0	19	9	0	12	23	22

CAUSE:

There can be several reasons why back pressure can arise in the bitumen transfer system, including, but not limited to:-

- Cold spots in the bitumen line.
- Too many bends in the bitumen line.
- Too small a capacity vent line.
- Blockages or partial blockages in the delivery line or vent line.

Frequently, these situations arise because bitumen is subjected to “shock cooling” when it leaves the hot tanker and enters the cold pipeline. It may be that bitumen flow continues slowly, but the pipe diameter is restricted because bitumen has cooled around the walls of the pipe. Conversely, it could be that post transfer bitumen cannot flow to drain and so blocks the line for subsequent deliveries.

SOLUTION:

One convenient solution to improve this situation and reduce the incidence of full or partial blockages is trace heating of transfer pipelines. This approach can be very effective if it is properly thought out and risk assessed.

The following points need to be considered:-

- Install electrical trace heating where the temperature can be easily controlled.
- Set the temperature around the minimum pumping temperature of the bitumen to be transferred.
- Set the heating to come on prior to the expected delivery time in order to pre heat the pipework.
    - Ensure there is sufficient time to adequately heat the pipe to avoid shock cooling.
    - The heat is not left too long to create burning of the bitumen residual in the line.
- Set the system to turn off some time after the delivery is completed.
    - You need to ensure the bitumen left in the line can adequately drain.
    - The heat is not left too long to create burning of the bitumen.

A suitable and sufficient Risk Assessment should be carried out, utilising appropriate assessment tools such as HAZOP, where appropriate, to better understand the most appropriate solutions for each individual incident.