Permit: KP3734SH

Navigator Terminals Windmill Ltd

Annual Review (2017) of Fugitive Emission Testing.

Date: 22/3/18

Objective

To review the fugitive emission testing at the Windmill Site regarding the application of Best Available Techniques. Permit Condition 4.1.4

Scope

All equipment utilised in the storage and handling of methanol on the Navigator Site, inclusive but not limited to: tank vents, pipelines, pumps, filters, flanges, seals and glands.

Exceptions

The ship unloading system is only full during ship off loading operations (less than 7%) and as such does not form part of every quarterly programmed fugitive test. Visual checks on the shipping pipelines and fitments are carried out at the commencement of every shipping operation and logged. The pipeline is fully welded from the site to the berths.

Test Methods Adopted

US EPA "Method 21" using a flame ionisation detector (Foxboro TVA 1000B)

Monitoring

- LDAR Envolve retained for 2017 to carry out the monitoring. Agreement made with AK (16-11-17), that sufficient data was available to justify a reduction in monitoring to 6 monthly. Thus, monitoring only performed 3 times in 2017.
- All valves, pumps, filters and flanges (398) tested each visit.
- The four methanol tanks tested at 16 circumferential vent positions to monitor the performance of the internal floating roof seals.
- Monitoring results used to pinpoint any deterioration of seals, flange joints and glands etc, and prioritising of maintenance activities. (Action level>500ppm)
- Results obtained used to estimate the methanol fugitive emissions for the annual reporting.

Conclusions

The monitoring regime onsite has reached a mature stage, whereby most flange joints being identified as leak sources have been addressed. It is anticipated that in the future, leak sources

will be related to failures of valve packing (due to wear), and due to re-jointing after performing maintenance. In general, minimal invasive maintenance is performed so this is not expected to be a common occurrence.

During 2017, one flange was recorded with a reading of 1900ppm. All other points tested were below the 500ppm threshold for action. This defect was managed via the site maintenance management system and the flange re-torqued. Emissions will be monitored at the next planned LDAR monitoring.

The total calculated methanol emissions for 2017 was recorded as 34kgs based on the LDAR monitoring results.

The LDAR programme still is regarded as an effective means of monitoring for potential methanol leakage.

Best Regards

Andy Jackson