Warwick Chemicals
Mostyn
Holywell
Flintshire
CH8 9HE

Report for Natural Resources Wales - review of fugitive emissions for 2015

INTRODUCTION

This report has been drafted in order to comply with clause 4.1.4 of the company's EP permit, number BU 2357 (as varied):

4.1 .4

The Operator shall review fugitive emissions, having regard to the application of Best Available Techniques, on an annual basis, or such other period as shall be agreed in writing by the Agency, and a summary report on this review shall be sent to the Agency detailing such releases and the measures taken to reduce them within 3 months of the end of such period.

BACKGROUND

The issue of fugitive emissions is high on the list of company concerns as failure to address these early enough can result in a greater loss of containment, potential environmental problems, neighbourhood complaints and the associated financial implications with all of these issues.
Historically there had been a number of complaints from the local inhabitants about particular smells that had been attributed to accidental releases (fugitive emissions) from the site. Considerable work has been put into rectifying these problems with the result that there has been a significant reduction in the number of complaints over the past seventeen years.
There have been no external complaints regarding smells reported to Warwick Chemicals in 2015.

The company's primary concern is with VOC's as this potentially represents a greater impact on the environment as well as health and safety although there are several other areas where fugitive emissions can occur (cooling tower discharge and particulates from boiler stacks)
It is felt that the particulate release from the boiler stacks is minimal as the primary fuel, gas, is very clean. The testing of the boilers on the stand-by diesel fuel is no longer carried out. The boilers are on a regular maintenance regime to ensure that they operate as efficiently as possible.
The operating cooling towers are cleaned at least once a year, are equipped with continual dosing systems and are tested every two weeks. This maintenance regime is suitable for keeping any emissions to a minimum.

REVIEW

Once again the manufacturing plants were operating at near full capacity for the greater part of the year.

The operation of the incinerator has been more efficient but has still suffered from some mechanical problems. We are now able to store the residue material on site and feed it back into the incinerator rather than send it off-site for disposal. This is more energy efficient from a transport fuel, waste recovery and steam generation point of view.
Work is still on-going to reduce the quantity of residues produced during the process.

Seven main areas were reviewed and considerations made for each area:

1. Acetic Acid & Acetic Anhydride
2. Ethylene diamine

3. Diesel
4. VOC's from gas combustion or incineration of residues
5. VOC's from paints or solvents
6. Thermal transfer fluid
7. Loss of containment incidents

1 ACETIC ACID & ACETIC ANHYDRIDE

In the production plant and tank farm areas fugitive emissions of acetic acid/acetic anhydride generally come from leaking pipe work, pump seals/glands, and any spillage incident. There is the potential for emissions from scrubber systems that have not been able to effectively cope with the quantity of acid gas passing through the system.
The push to get more reporting from the manufacturing staff has resulted in an increase in the number of reported leaks.
There have been no emission breaches from any of the emission release points in 2015.
The successful operation of the AED Recycle plant will allow Plant 3, Plant 6 and the wiped film evaporator to shut down reducing the possibility of fugitive emissions and consent breached from the scrubbing systems.

2 ETHYLENE DIAMINE

There has been no change to the EDA offloading/storage/circulation system. Any emissions from the offloading procedure are still passed through the wet scrubber system. The only destination for EDA is still the DAED production plant, the pipework to all other plants has been removed.
Calculations of the emissions based on raw material offloading frequency for this year has been the same.

3 DIESEL

The use of diesel on site is an ongoing concern to the company as any release of this material into the river will have a significant environmental impact. However, as the quantity of diesel stored on site at any one time has significantly reduced the risk has been minimised. The management of the diesel used by contracting companies has stepped up and they are monitored when using generators or welding sets to ensure that there are drip trays under their equipment. A number of 'pigs' have been lowered into the central collection chamber to remove any oil that has become entrained in the water from the production areas. These are changed on a regular basis and, so far, there appears to be a slight reduction in the quantity of oil detected in the water.
The large diesel storage tank (25,000 litres) located by the DAED hot oil building remains empty and it has been suggested that this is removed.

The diesel tanks in Tank Farm 2 have been emptied and are currently waiting to be cleaned and then removed from site.

The scheduled activities, involving diesel, are still carried out:

- running the stand-by hydraulic pump for the waste water treatment plant. This is now only carried out when the central collection chamber is cleaned out (every eight to ten weeks) and is part of a maintenance activity. The test running has been phased out.
- test running the delivery pumps for the deluge system for the DAED/AED Plant once a week. This has to be carried out for 30 minutes to allow the diesel engines to reach their designed operating temperature.

All these activities will produce VOC's (and particulates) but are necessary to ensure that these systems will operate on demand. The operation of this equipment has been reviewed and the revised frequency of operation is thought to be suitable.

4 VOC'S FROM GAS COMBUSTION

The primary use of gas on this site is for combustion for steam generation. The main steam boilers are maintained and checked every two weeks to ensure that they are running at peak efficiency.
The other gas usage is on the incinerator unit where it is used to heat up the unit to operating temperature before the residue fuel is ignited. The operating regime of the incinerator has changed slightly to optimise operations. The unit is now run at a slightly lower throughput with the effect that the continual run times are longer and the overall down time is less. This has the effect of reducing the quantity of gas used as there are fewer start-ups. It has also meant that the operation has been more stable with a slight reduction in overall emission levels.

Calculations for the amount of VOC's produced from gas combustion in the boilers and incinerator are based on spot monitoring carried out by Exova. Some assumptions have been made with the calculations but the final figure is 3kg. This is a significant decrease on previous figures.

5 VOC'S FROM PAINTS & SOLVENTS

The quantity of painting carried out in 2015 has been approximately the same as last year with a similar amount of emissions, calculated to be around 200kgs (a slight reduction from last year)

The quantity of solvents used on site by the Engineering Department, R & D Department and Analytical Department is relatively small and work has been done to look for suitable alternatives. The solvents currently used will be the ones most suitable for that particular duty and until an alternative is available the situation will remain the same.
The procedures for the use of and disposal/recycling of solvents are reviewed and audited with any suggested improvements being implemented as soon as possible.

6 THERMAL TRANSFER FLUID

Although the total volume of thermal transfer fluid in the system has increased (now includes the AED Plant equipment) the operation of the system is still the same. Calculations for the amount of VOC's produced by the operation of the hot oil system has remained the same this year and amounts to ~ 5kg

7 Loss of Containment Incidents

There have been no significant loss of containment issues in 2015, nothing reportable. As stated above there has been a push on reporting any incidents that have occurred on the site and specifically the manufacturing areas. This has led to an apparent increase in the number of containment failures. However, on investigation these have not been significant and the early alert has prevented an escalation and quick resolution of the problem.

CONCLUSION

There are a number of projects that have been carried out (some still to be completed) that will reduce the possibility of fugitive emissions from the raw material storage and production areas on site.
The push to get the staff to report problems is now showing some results with repairs being carried out sooner, resulting in the reduction of any fugitive emissions. This push will continue through the next year. This coupled with increased instrumentation, safety systems and the operation of the AED Recycle Plant will allow for a process that is better managed which in turn should improve the response time for repairs and recovery and a reduction in overall fugitive emissions.

The site does follow a process of continual improvement and so there are processing, production and engineering improvements year on year. These changes, however small, will provide some reduction in the fugitive emissions from the site.