

## HyNet Hydrogen Production Plant 1 – Technical Note

### EPR – 7a – Minimisation of Amine Carry Over

#### Summary

##### Problem Statement

BAT for minimisation of amine carry-over in CO<sub>2</sub>.

Describe operating techniques and process monitoring that will be implemented to prevent and minimise carry-over of amine in the captured CO<sub>2</sub> stream.

Notes: Refer to the requirements of the 'Guidance for Establishing Best Available Techniques for Hydrogen Production from Methane and Refinery Fuel Gas with Carbon Capture': 'The overhead condenser/ reflux system and section above the feed on the solvent regeneration column will minimise potential for solvent to reach the CO<sub>2</sub> product. And also: 'Potential for atmospheric emission of solvent or associated substances should be low in such circumstances, but measures taken to mitigate this, such as ensuring continued operation of the regenerator overhead condenser and reflux system, should be identified.'

#### Response

##### Operating techniques

The regenerator overhead condenser is a main heat sink in the overall process. It is included to minimise water and amine losses. The CO<sub>2</sub> capture unit design has opted for an air-cooled condenser instead of a quench type condenser, to reduce and minimise amine losses which would be associated with a quench type condenser. Using a quench type condenser would lead to higher concentration of amine which is found within the quenched looped system.

The design of the CO<sub>2</sub> capture unit also includes the implementation of a back wash tray system which minimizes the carry-over losses in the CO<sub>2</sub> stream.

##### Process monitoring

The CO<sub>2</sub> capture unit has been designed with several sampling locations. There is a sample point on the outlet of the LP flash column reflux drum [V-117]. This is to monitor any possible amine carry over to the captured CO<sub>2</sub> stream. This monitoring setup and sample connection is standard practice.

The HyNet CO<sub>2</sub> transport and storage network will have strict specifications for amine carryover into the capture CO<sub>2</sub> stream, to control liquid drop-out in the pipeline. Therefore, this will also be closely monitored (either by routine sampling or online analysis (to be confirmed) as part of the commercial offtake agreement with the Transport and Storage operator.