

## HyNet Hydrogen Production Plant 1 – Technical Note

### EPR Response – 2e: Operating Techniques and BAT for the Flare

#### Summary

##### Background

The flare datasheet specifies a noise limit of 85 dBA at the flare base and <85 dBA at the sterile boundary. It does not identify specific noise control measures.

##### Problem Statement

Describe any design measures to mitigate noise emissions from the operations of the flare.

##### Action

Kent to review and seek response using market information where necessary.

#### Response

##### Existing Project Details

The flare datasheet (Document no. 5194812-000-45ED-4-0004) specifies a noise limit of 85 dBA at the flare base and <85 dBA at the sterile boundary. It does not identify specific noise control measures, these are for the Flare Vendor to advise, if they are required.

During the FEED Phase of the project, proposals were received from two vendors as follows:

- Zeeco Europe, and,
- GBA Flare Systems.

Personnel are not allowed entry into the sterile radius in normal circumstances and entry must be scheduled and permitted formally. Therefore the most critical noise measurement is at the sterile radius boundary, where operators are permitted. GBA Flare systems undertook some noise modelling at the project's request, to ensure the noise level was less than 85dB(A) at the sterile radius. Please see Fig.1.

#### 4.2.2 Noise

All noise data is based on stack height of 60m including flare tip. Noise data below:-

Case	Flowrate (kg/hr)	Noise Level in dB(A) At 2m above grade
		46m From Base of Stack
Warm/Wet Case 1	221,698	81
Warm/Wet Case 2	79,511	<20
Warm/Wet Case 3	151,700	76
Warm/Wet Case 4	17,940	<20
Cold/Dry Case 1	60,434	79

The noise emission of the low pressure releases has been produced using GBA proprietary software PFD Ver 4.6

These programs produce noise predictions based on the gas flow rates, the type and size of tip, the gas composition and other factors.

**Fig.1 – Extract from GBA FEED Proposal showing Noise Emission Data.**

As can be seen the modelling showed that for all Flare process cases, the noise level met the requirements of the datasheet at the sterile radius.

## Mitigations

In general, even though GBA Flare systems provided noise data during the FEED phase of the project, specific flare noise modelling from the selected flare vendor will be undertaken in the detailed design phase (next phase). Due to the fact GBA had provided the noise data they were contacted to advise on any mitigations that could be used if required in the future. They advised that increasing the diameter of the tip exit is typically the most common mitigation to reduce noise. Increasing stack height is also an option if required, but no mitigations are needed currently for the flare design as it stands.

The final option, if vendors cannot meet the noise criteria, is to increase the sterile area radius.

It is important to note that the noise values shown in Fig. 1 are during flare events only. During normal operation, only a pilot flame is lit and the noise is negligible from grade level. No operations or maintenance (or other) personnel are permitted within the sterile radius during a flare event.

## Updates to Design

None required. The datasheet states the maximum noise levels required and the Vendor has advised that there are no particular mitigations needed to achieve the requirements at the sterile boundary.