

## HyNet Hydrogen Production Plant 1 – Technical Note

### EPR Response – 11B – Emergency Generators

#### Summary

##### Problem Statement

Confirm whether the proposed emergency diesel generator (2.9 MWth input) will be specified to meet BAT standards for emissions from standby generators (i.e. TA-Luft 2g, or US EPA Tier 2 standard or equivalent) and whether they will consist of vertical, elevated stacks with unimpeded emission point (no cowls and caps) and will be provided with sampling ports.

##### Action

The project datasheet (Document No. 5194812-000-45ED-4-0002) included Note 7 which defined preliminary emissions limits for the package. This note had a hold on it (HOLD 2) which explained that the emissions limits were to be confirmed at a later time, assumed during detailed design.

The preliminary emissions limits are shown below, taken from the note in the datasheet:

##### 7 Project emission standards are as follows: (HOLD 2)

Maximum allowable limits for emissions (mg/m <sup>3</sup> ) @ ref conditions of 273K and O <sub>2</sub> =15%				
Fuel Type	Total Solid Particles (TSP)	Carbon Monoxide (CO)	Sulphur Dioxide (SO <sub>2</sub> )	Nitrogen Oxides (NO <sub>x</sub> )
Diesel	100	250	400	500

The NO<sub>x</sub> limit requested is 500 mg/m<sup>3</sup> at 15% O<sub>2</sub> and 273K. Converted to 5% O<sub>2</sub>, the NO<sub>x</sub> emissions are 800 mg/m<sup>3</sup>. This is more stringent than the limits described in the Background section above.

Kent received proposals from two (2) Vendors during the FEED stage:

- Finning (a Caterpillar dealer)
- Cummins Power Systems

Both Vendors offered low emissions engines with a summary on each below:

**Finning:** Offered low emissions engine, without exhaust treatment. They stated that The engine does not meet the NO<sub>x</sub> limit from the datasheet, and If these emission levels are to be meet, then exhaust after treatment will be required which will add addition equipment/complexity to the package.

**Cummins Power Systems:** Offered low emissions engine, and could provide TA luft compliance if required. They included supply of a Generator Exhaust aftertreatment system to meet the defined emissions limits of the datasheet.

As can be seen, both would need after treatment, increasing the cost and complexity of the packages. Cummins advised that TA-Luft compliance could be offered and this is seen as preferential over the datasheet limits, which may lead to a less complex package.

On reviewing both TA-Luft and US EPA standards, Kent feels it is more appropriate to use the German standard, TA-Luft, rather than the American, US EPA, due to the installation being in the United Kingdom, formerly part of the European Union.

#### Response

##### Summary

The project datasheet has ben marked up ready for its next issue.

##### Updates to Design

Updates are required to the project datasheet (Document No. 5194812-000-45ED-4-0002) as follows:

ADD: Note 11, to ensure the Vendor includes for vertical, elevated stacks with unimpeded emission point (no cowls and caps) and emissions sampling points/ports within the exhaust stack structure.

CHANGE: Note 7 to require compliance with 2G TA-Luft in replace of the emissions stated currently.

REMOVE: HOLD 2.

These are shown as red line mark-ups in Attachment 1.

ATTACHMENT 1: Project Datasheet Red Line Mark-Up

(Datasheet No. 5194812-000-45ED-4-0002)