HyNet Hydrogen Production Plant 1 – Technical Note

EPR Schedule 5 Clarification Response

Item 1

Question

Advice the type/specification of the sulphur species analyser proposed to be added on the ROG header Ref. 'EPR Response 2a' and confirm the type of analyser specified will be suitable for the fast-cycle response (1 second analysis cycle) referred to in the response3

Response

Analysis time confirmed to be 0.75seconds

This is shown in Attachment 1

ATTACHMENT 1 – Sulphur Analyser Vendor datasheet

Item 2

Question

Clarification is needed on the conflicting emission levels stated in the data sheets provided in 'EPR Response – 5b' and 'EPR Response – 5d'.

- NOx ELV is stated as 80 mg/Nm3 in the body of the response. However the data sheets show 80 ppmv, that corresponds to 153 mg/Nm3
- CO ELV is stated as 100 mg/Nm3 in the body of the response. However the data sheets show 100 ppmv, that corresponds to 116 mg/Nm3

Please confirm that 80 mg/Nm3 for NOx and 100 mg/Nm3 for CO (averaged over the sampling period for the proposed periodic monitoring), have actually been confirmed to be achievable without SCR by the combustion equipment vendors and that these are proposed as emission limit values for the Feed Fired Heater and Steam Boiler.

Response

Vendors have confirmed that for NOx 80mg/Nm3 is achievable and for CO 100mg/Nm3 is achievable without SCR. Datasheets have been updated accordingly.

Item 3

Question

Reference: EPR Response – 9gii – Energy Efficiency of Combustion Equipment. Clarify whether the BFW pre-heated prior to routing to Drum V110 is heated against the flue gases from the combustion process (i.e. whether heat exchanger E-109 is an economiser).

Response

Yes, we can confirm that E-109 (BFW Pre-Heater) pre-heats the BFW prior to routing it to Drum V110 by heating against the flue gases from the combustion process; i.e. heat exchanger E-109 is an economiser.

Item 4

Question

The description of the Fire & Gas detection system provided in ref. EPR RESPONSE – 10a – Availability and Reliability, mentions the following detectors: Flammable gas detectors (for hydrocarbon gas, H2 and O2); Process gas detectors (for CO2 and N2); Smoke detectors (including high sensibility smoke detectors); Heat detectors; Gas leak detectors. Clarify whether carbon monoxide detectors will be installed and/or explain the justification for not including them.

Response

Yes, we can confirm that the Fire Gas Detection System specification includes gas leak detectors for Carbon Monoxide.

Item 5

Question

5. Ref. EPR RESPONSE – 10a – Availability and Reliability: this technical note refers to the hydrogen product blow-down system: 'Hydrogen Export Blowdown A single blowdown valve, 10-200-AAD-BDV-0002, is provided as part of the hydrogen export system which blowdowns the inventory between the Product Hydrogen Cooler, E-123, and the shutdown valves located on each export pipeline.'

a. Please confirm whether the blowdown of hydrogen product is routed to the flare system for safe combustion of hydrogen on emergency depressurisation.

b. Following and related to the response to item a., provide additional clarification in relation to response to item 'EPR Response – 2C', where it is stated that there are no cases requiring 100% hydrogen combustion and so the flare does not need to be designed for this.

Response

a. Yes we can confirm that the hydrogen would be routed to flare.

b. Although there is the potential for a blocked outlet case from the HPP which would result in 100% hydrogen being routed to flare for a short period, this is unlikely because the HPP will export hydrogen to both the Stanlow Manufacturing Complex and to Cadent; i.e. both would need to be simultaneously blocked (and not a plant shutdown as hydrocarbons would be routed to flare as well).

Should there be a 100% hydrogen case for the flare because of both routes being simultaneously blocked from both HPP1 and HPP2 then the mass flow to the flare is significantly lower (~90%) than the current maximum flaring cases. Case 3 on the flare package datasheet [5194812-000-45ED-4-0004] contains approximately the same mass of hydrogen in the flow if there were only a "100%" hydrogen case (~17t/hr) and therefore the project does not have concerns over the operation of the flare, combustion, radiation contours, etc. Initial discussions with flare vendors around a 100% hydrogen case suggest that this hydrogen flow rate would be handled by the current cases/flare design.

A reduced flow 100% Hydrogen case to cover the hydrogen from the HPP will be added to the flare datasheet for completeness.

Item 6

Question

Reference 'EPR Response – 13a – Secondary Containment Materials' states that a bund is not required for the 'Waste Water Blending Tank', although the service indicated for this tank is 'waste'. On further review, we have identified this tank as item 10-BAG-T-001 on PFD 5194812-000-49DG02-4-0006-01 REV 5, previously provided. We note that this tank blends all the sources of process waste water prior to feeding it to the MBR biological process, which is the core of the hazardous biological treatment activity S5.3 Part A (1) (a) (i) in the scope of the variation application. Due to the nature of the untreated waste water, the Waste Water Blending Tank therefore needs full secondary containment adequately sized to meet the requirements of CIRIA 736. Please clarify on this aspect of the design and/or provide evidence of revised design including full bunding for the 'Waste Water Blending Tank' designed to CIRIA 736 standards.

Response

The Waste Water Tank will include full bunding to CIRIA 736 standards.

Item 7

Question

Reference 'EPR Response – 13a – Secondary Containment Materials' does not include the material of construction for the secondary containment bunds/sumps for the sub-surface process drums referred to in the 'Environmental Permit Application Supporting Document', namely: the Amine Drain Drum, TEG Drain Drum and Closed Drains Drum. Please address the secondary containment design plans for this underground equipment.

Response

See table below:

Tag	Name of drum	Bund material	Location of liner - HDPE
10-FAA-V-119	Amine drain drum	Reinforced concrete	Bunds
10-FAB-V-102	TEG drains drum	Reinforced concrete	Bunds
10-BAG-V-002	Closed drains drum	Reinforced concrete	Bunds

Item 8

Question

Pipelines. From the incomplete response on the CO2 venting risk assessment, item 19 of the Schedule 5 Notice, it has emerged that the pipelines technically connected to the HPP may play a role in determining potential emissions in the case of other than normal operating conditions (OTNOC). Please provide a process description of the pipelines connected to the proposed activities, including the following information:

a. service

b. process conditions (pressure, temperature)

c. physical phase

d. Isolation philosophy and battery limit / interface between the Stanlow Manufacturing Complex and activities operated by others

e. Blowdown philosophy (e.g. you need to clarify whether the AGI pipelines vents would be used to depressurise the CO2 pipelines in full or in part and, if so, during which situations; the response to this item needs to be reflected in the modelling input to CO2 venting risk assessment).

Response

There are 3 Above Ground Installations (AGIs) that will be connected to HPP to import feedstock and export product. For each of these installations, the only interface to HPP will be the incoming/outgoing pipelines i.e.: there are no drains or vents which cross the interface. Each AGI operator is responsible for blowdown/depressurisation of the pipeline and equipment on their side of the interface; the contents will not be sent to the HPP for flaring or venting. This has recently been confirmed with the pipeline design projects. There will be remotely operated shutdown/trip valves and manual double block valves & spade points at the Vertex side of each battery limit.

Taking each in turn:

CO2 export
Normal Operating Pressure: 7.5-35barg
Normal Operating Temperature: 40-45degC
Physical Phase: Gas

H2 export
Normal Operating Pressure: 35-45barg
Normal Operating Temperature: 10-35degC
Physical Phase: Gas

Natural Gas Import - National Grid National Transmission system (NTS)
Normal Operating Pressure from NTS: 42-65barg
Normal Operating Temperature from NTS: 5-17degC
Physical Phase: Gas