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Date: 20 November 2024
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To Whom It May Concern

Planning Act 2008 – Section 89 and The Infrastructure Planning (Examination Procedure) Rules 2010

Application by H2Teesside Limited for an Order Granting Development Consent for the H2Teesside Project

Unique Reference: 20049379

Response to Deadline 4 – Comments on any other submissions received at DL3

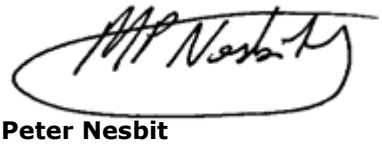
This letter is sent on behalf of Sembcorp Utilities (UK) Limited ("Sembcorp"), registered as an Interested Party for the above application, in accordance with Deadline 4.

Comments on Applicant's responses to Deadline 2 submissions

Please see below for Sembcorp's response to the Applicant's responses to Deadline 2 submissions.

I trust that the below is clear however please do not hesitate to contact me should you have any queries.

Yours sincerely



Peter Nesbit
Partner
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COMMENTS ON THE APPLICANT'S RESPONSES TO DEADLINE 2 SUBMISSIONS

REFERENCE	SOURCE DOCUMENT(S)	IP ISSUE/THEME	APPLICANT RESPONSE	SEMBCORP RESPONSE
Sembcorp1	Comments on any submissions received at DL1, including LI Rs any updated dDCO and the Applicant's draft itinerary for the ASI [REP2-101]	The Applicant should provide evidence that it considered developing a new multiuser tunnel according to NPS EN1 - "*4.3.15 Applicants are obliged to include in their ES, information about the reasonable alternatives they have studied. This should include an indication of the main reasons for the applicant's choice, taking into account the environmental, social and economic effects and including, where relevant, technical and commercial feasibility*." And the government Guidance on Associated Development "Associated development should be proportionate to the nature and scale of the principal development. However, this core principle should not be read as excluding associated infrastructure development (such as a network connection) that is on a larger scale than is necessary to serve the principal development if that associated infrastructure provides capacity that is likely to be required for another proposed major infrastructure project.3"	As explained in ISH1 the DCO application as submitted includes a hydrogen pipeline crossing under the River Tees to meet the operational needs for H2T, defined in Work No. 6 as "a hydrogen distribution network, being works for the transport of hydrogen gas .". If the pipe was to cater for other developments or uses, it would need to be established that this was nevertheless Associated Development (i.e. development associated with the principal development). That would require a direct relationship with the principal development and assessment against the core principles set out in the Government's Guidance on associated development applications for major infrastructure projects (2013).	Firstly the Applicant's response fails to address the ES flaw in failing to include information on the reasonable alternatives which the Applicant plainly considered; as has been evidenced by the Sembcorp. Secondly, the Applicant seeks to characterise the Government guidance on Associated Development as preventing an applicant providing overcapacity in infrastructure which would benefit another proposed major infrastructure project, when in fact this approach is expressly <u>not</u> excluded from the concept of Associated Development.
Sembcorp2	Responses to comments on Relevant Representations [REP2-102]	• Draft protective provisions awaited • Concerns raised over the capacity of the pipeline corridors and the interrelationship of the various DCO projects in the area • Concerns raised over the impact of the Tees crossing on the existing infrastructure and the constraints this could place on future crossings	The Applicant has had productive discussions with Sembcorp on the principles for bespoke protective provisions and continues to progress these discussions. The Applicant's legal and technical teams are progressing draft protective provisions for issue to Sembcorp. The Applicant remains committed to ongoing engagement and will continue to work closely with Sembcorp to ensure that any concerns are addressed adequately through protective provisions and other technical discussions. The Applicant believes its pipeline can be accommodated within the pipeline corridor without unduly impacting the potential for future projects based on the engineering design work and site surveys performed and looks forward to continued discussions with Sembcorp in this regard. The Applicant would refer to its input provided during ISH1 [REP1-008] regarding the Tees Crossing. Each new crossing has incrementally added to the difficulty of future crossings. As such, while all previous crossings have been installed in parallel arrangements, there is no available route for the Project's crossing which avoids intersection with existing crossings. The Project has been designed to overcome the additional complexity involved in its own river crossing caused by existing crossings. Any future crossing would similarly have to account for the complexity caused by existing pipelines. This Project may add an additional layer of complexity but in principle this is not new or unacceptable, and it would not render future crossings impossible.	Sembcorp remains concerned about the Tees Crossing, both in terms of the severe difficulty this will create for future crossings and the potential for damage to existing sensitive infrastructure as previously outlined.
Sembcorp3	Responses to the Examining Authority's First Written Questions (ExQ1)	• Q1.6.62 - Concerns over interference with access to assets for both SembCorp and	The Applicant acknowledges Sembcorp's concerns regarding potential interference with access to assets for both Sembcorp and its tenants, as well as the	Noted.

	[REP2-103]	its Tenants and potentially prevent future tenants and new customers from maturing • 01.9.67 - Draft PPs are yet to be issued • Q1.17.1- Access rights remain a concern	potential impact on future tenants and new customers. The Applicant considers that access protections will be addressed through negotiation of Protective Provisions (PPs).	
Sembcorp4	Written Representation [REP2-104]	Part 1- Safety Concerns 2.1. Sembcorp is concerned about the safety of those parts of the Applicant's network comprising above-ground hydrogen pipelines and questions whether, fundamentally, this is a safe approach which is ALARP (as defined in paragraph 20.2.5 of Chapter 20 of the ES). 2.2 Issues include greater propensity for leaks, flammability, detection difficulties, explosivity, risk of asphyxiation, temperature control of above ground hydrogen. 2.3 Proximity of above ground pipelines to other hazardous substances in pre-existing pipelines. 2.4 Above ground leakages compared to buried lines. 2.5 Considering ALARP, SembCorp believes that the risks associated with the Applicants proposed pipeline would be significantly reduced by burying the pipeline, rather than routing above ground. 2.6 Sembcorp is concerned by domino effects caused by interactions with existing COMAH facilities in the Wilton International Site. 2.7 The presence of H2 pipes above ground may disproportionately use up capacity on existing pipeline racking due to greater buffers being required to achieve appropriate separation. 2.8 External interference of above ground pipelines is considered as a specific threat to pipeline integrity as indicated in TD/1 with gas pipelines being buried this significantly reduces this risk	2.1. The Applicant considers safety as its number one priority and will use their many years of experience to ensure that H2Teesside is operated in accordance with its operating management system, to prevent harm to people and the environment. The Applicant is following industry norms to identify, confirm and assesses the hazards related to the project, and ensure that there are processes in place to manage these hazards appropriately, during the operation of H2Teesside. Risks that are identified through this process to require the demonstration of ALARP will do so through established processes. 2.2 These issues are noted and are being considered in the design of theH2Teeside plant and pipeline System. 2.3 The Applicant is aware of site-specific risks introduced by the existing assets in Teesside, which includes Major Accident Hazard Pipelines (MAHP), and is aware of the potential for domino effects in the event of a failure. Domino effect, or escalation, will be considered as part of the FEED Phase Quantitative Risk Assessment (QRA). The Applicant will collect information about the existing assets within the pipeline corridor and, if possible, information about the existing site safety plans. The assessment will determine what the increased risk is due to the Hydrogen pipeline. The Applicant will demonstrate to the HSE in the Safety Report that these escalation risks are ALARP. 2.4 Within Teesside, there is limited space for a buried pipeline given the existing aboveground pipeline routes throughout the area. The Applicant proposes to install the hydrogen pipeline above ground where there are existing above ground pipeline corridors and where there is not sufficient space for below ground installation. Buried pipeline sections include: Teesworks and Seal Sands pipeline from the H2Teesside plant to the Bran Sands Corridor Greatham Creek pipeline Transmission and Industrial pipeline to Cowpen Bewley Other pipeline segments will be installed aboveground. As part of engineering design, the Applicant will perform Quantitative Risk Assessment which will consider the additional threats to the pipeline from above ground installation, where applicable, and the failure frequency used in the analysis will be adjusted accordingly. The methodology will follow the HSE Guidance Note RR1186: Failure rates for above ground major accident hazard pipelines outside above ground installations. Additional risks to be considered are included vandalism, road/rail/aircraft crashes. The methodology for aircrafts follows the HSE Guidance note.	Sembcorp notes these responses and looks forward to discussing these matters further with the Applicant in the proposed technical meeting.

			2.5 The Applicant has considered Inherently Safer Design (ISD) to start with and analysis so far has indicated that design falls within the 'Broadly Acceptable' region. Nevertheless, mitigation of risk analysis is being included in the FEED studies to ensure all measures are considered from the hierarchy of controls to ensure an ALARP design. 2.6 The Applicant is engaging with the Competent Authority in relation to COMAH. The Applicant appreciates that the Proposed Development Site is located within an area which has a number of COMAH installations, forming a domino group as described in Regulation 24 of COMAH (See Chapter 20-APP-73). In the design phase of the Project the risk of domino effects will be considered, and appropriate mitigation measures will be adopted to demonstrate ALARP. 2.7 The project will not take up disproportional space as typical buffers for access and maintenance for pipelines shall be used. This is 1 metre in all directions. The potential escalation impact will be assessed using this distance. If escalation events are found to be a concern, mitigation methods such as increasing pipe wall thickness may be implemented. The majority of existing pipeline corridors are highly congested, however not all assets are in service. 2.8 IGEM/TD/I Ed. 6 is the primary design code for H2Teesside pipelines, and IGEM/TD/1 Supplement 2 is being applied for the hydrogen lines. During discussions with the Applicant, the Institute of Gas Engineers and Managers (IGEM) recommended that independent professional advice should be sought to confirm the applicability of TD/1 to above ground hydrogen pipelines. The Applicant engaged a competent engineering contractor who are members of IGEM and contributed to the development of IGEM/TD/1. The contractor concluded that IGEM/TD/1 philosophy was applicable for above ground hydrogen pipelines. An appropriate technical meeting has been arranged to discuss this further with Sembcorp.	
Sembcorp5	Written Representation [REP2-104]	Part 2-Existing Underground River Crossing Assets 2.9 SembCorp has additional concerns relating to the River Tees crossing and the proximity of the Proposed Development to Tunnel 2 as well as Sembcorp's 24" natural gas pipeline and 8" propane pipeline. 2.10 The methodology of HDD diagonally across existing assets could have adverse impacts on the existing pipelines and tunnels crossing the Tees as all other assets run parallel to each other. 2.11 Concerns about damage inadvertently caused by microbore/HDD method on existing infrastructure through accidental collision, subsidence or vibration. It is not clear to	The Applicant is in discussions with Sembcorp relating to the proposed crossing of the River Tees. Further investigations and technical assessments are required before a final crossing methodology can be confirmed. The Applicant is committed to working closely with Sembcorp and other stakeholders to ensure that any potential impacts are thoroughly evaluated and mitigated. 2.9 The Applicant has collected information about existing assets crossing the river from historical records. The Applicant will provide information about all existing assets to its specialist subcontractor for design of the Tees Crossing during FEED phase. The specialist subcontractor will review the information	Whilst Sembcorp notes these responses, it remains concerned about the potential for damage to existing infrastructure under the river. As the detailed design and baseline conditions are not currently available for IPs or the Examining Authority to consider in detail and noting the proposed disapplications in Articles 9(2)(a) and 9(2)(b) of the draft DCO (in respect of important detailed approvals normally required from the Statutory Harbour Authority), it would assist if the Applicant could confirm what alternative or further approval mechanisms the Applicant proposes to ensure that the final design does not compromise existing critical infrastructure and that this is subject to appropriate third party scrutiny. Furthermore, the Applicant's response does not address the issue of monitoring arrangements post construction to identify and address any longer term damage arising to surrounding infrastructure. It would assist if the Applicant could identify where and how such mitigation is secured.

		Sembcorp what mitigations and/or separations the Applicant proposes to prevent such damage, nor how any impacts may be monitored, during and post construction	and design the H2Teesside Tees Crossing appropriately, with suitable crossing techniques and separation distances. 2.10 The crossing angle of existing assets is dictated by land available for construction of the shaft, and available space being taken by existing assets. If there were sufficient space available then the Applicant would have selected a parallel alignment per the philosophy followed by other existing service crossings at this location. Because a parallel alignment is not available, the Applicant proposes to use an appropriate separation distance from other assets considering the selected crossing technology. Typical approach to crossings for pipelines to be at 90-degrees is not applicable as this is a special crossing, and the specific constraints must be considered. Microbored tunnels have been performed in other locations without parallel alignments, for example many tunnels for the London Underground cross services without considering a perpendicular crossing angle. 2.11 The vertical separation distance is currently set at >10m to all assets except the mud return pipeline (0.15m OD) pipeline which is >5m. The Applicant is using a specialist subcontractor to design the Tees Crossing. During the detailed engineering phase, this subcontractor will perform settlement calculations using the known information about soil conditions and existing assets in the area. This calculation will be used to confirm the selected separation distance is suitable. During construction, a settlement monitoring Programme will be used to verify that settlement and vibration are within tolerable limits set by the design.	