

Gas Network Innovation Competition Full Submission
Supplementary Answer Form

Project: H21

Tick if this answer has been provided verbally: ☐

Project code	NGNGN05	Question Number	8
Question date	22 nd August 2019	Answer date	27 th Aug 2019
Submission section question relates to	Appendix D5		
Topic	QRA		
Question	Phase 2c seeks to combine the Phase safety case with Hy4Heat with the Hy4Heat QRA. Why have you chosen to combine this with the Hy4Heat project solely, rather than also including other hydrogen innovation projects? Can you also explain why Phase 2c needs to be funded via the Network Innovation Competition?		
Notes on question			
Answer	<p>In Phase 1 of the H21 NIC project, there has been a lot of work done on the QRA for hydrogen. The objective of the updated QRA is to ensure that the use of hydrogen within the existing gas distribution network is as safe, or safer, than the use of methane. Depending on the results, additional safety measures may have to be implemented to reduce the risk.</p> <p>The current H21 QRA model is focussed on the safety of the gas networks and therefore only covers the distribution pipework up to the Emergency Control Valve (ECV). With the inclusion of the work that Hy4Heat have been performing on the risks downstream of the ECV, we will obtain a holistic view of the risk. This is important for consistency, because several of the key assumptions and modelling details for the QRA will be the same for the assessment of risk upstream and downstream of the ECV. These include aspects of the individual models within the QRA of gas build-up, ignition and explosions as well as assumptions about the properties of the gas, such as the effectiveness of the odorant selected. A holistic view of the overall risk is essential in order to make informed decisions about cost-effective mitigation of the overall risks in order to minimise the impact on the consumer.</p>		

	<p>We have had discussions with other innovation projects regarding their QRA's. These have included HyDeploy and H100. In developing the H21 QRA models, we have already been working in collaboration with other ongoing hydrogen innovation projects at a technical level, including meetings between the specialists involved in other projects to share learning. However, HyDeploy considers up to a 20% blend and the QRA for the H100 project has only considered the use of new equipment for the transportation of hydrogen (i.e. pipes, governors etc.). H21 addresses the reuse of the majority of the assets in the existing network for 100% hydrogen, including the roughly 10% metallic that will remain. By combining the upstream H21 QRA with the downstream Hy4Heat QRA, a complete assessment of the overall risk can be achieved.</p> <p>The modelling of the potential hazards associated with 100% hydrogen developed for the QRA, including gas leakage rates, migration through the ground, accumulation, ignition, etc. is also fundamental to establishing safe working practices for the GDN's operatives, such as in the emergency response to suspected gas escapes both upstream and downstream of the ECV. For example, the models help to establish criteria for evacuation and to set safety distances when dealing with a live gas escape and they will be used to support decisions as part of the H21 Phase 2 demonstration. In turn, new information and learning from the Phase 2 trials will potentially feed back into the modelling to allow the QRA to be updated and refined; hence the inclusion within H21 Phase 2.</p> <p>In summary, the reason that we have included combining the QRA's within this NIC submission is to ensure that the GDN's understand and can address any new risks that arise from the use of hydrogen in the existing gas networks. The GDN's also need to understand any risk mitigation that is being proposed downstream of the meter.</p>
Attachments	