Chemeca 2025 and Hazards Australasia
28 – 30 September, Adelaide, South Australia

Identifying Cross-Industry Collaborations to Support the Energy Transition

Tan Hui Min

huimin0809@gmail.com

ABSTRACT

One of the key gaps identified in the energy sector is the lack of collaboration in safety management systems across different industries. There is currently no widely adopted platform for sharing good practices or identified hazards that would potentially enhance safety and operational efficiency.

As the global push for energy transition and decarbonisation continues, hydrogen has emerged as a promising alternative fuel. The main focus of this assessment is to evaluate the potential to foster collaboration between stakeholders in liquefied natural gas (LNG) and liquefied hydrogen (LH2), to support this transition.

Hydrogen facilities currently face numerous safety standards and design challenges. Thus, it is deemed that by leveraging best practices adopted by LNG operators would be a good starting point for LH2 operators. This approach not only supports the safe development of LH2 infrastructure but also provides an opportunity for LNG operators to reassess and enhance their existing safety and design strategies. If relevant cost-effective or better technologies are identified during this process, they could be adopted across both sectors, ultimately enhancing safety standards across industries.

From an operational standpoint, LNG and LH2 share certain similarities. Both are typically liquefied for storage and transportation, which introduces cryogenic risks in addition to the well-known fire and explosion hazards posed by flammable gases. Thus, the prevention and mitigation measures in place at LNG facilities, especially measures targeting fire, explosion, and cryogenic risks, could serve as valuable references for LH2 facility design and operations.

However, several key differences between hydrogen and methane must also be acknowledged and considered during the assessment, as they significantly influence safety measures, facility design, and asset integrity. These include:

- *Higher flame speed of hydrogen as compared to methane;*
- *A higher vaporization rate for hydrogen; and*
- *Greater explosion overpressure potential with hydrogen.*

The objective of this study is to identify the similarities and differences between LNG and LH2 facilities and, through this understanding, uncover opportunities for cross-collaboration in hazard management and mitigation.

KEY WORDS

LNG, LH2, Fire, Explosion, Cryogenic

BIOGRAPHY

Hui Min has approximately 5 years of engineering, consulting, technical risk and safety, and project management in the energy industry. In her previous and current roles, she is responsible for the execution and management of safety and risk consultancy projects serving various clients in the energy industry.

She has experience in conducting qualitative and quantitative technical risk and safety studies, functional safety assessment, process safety and operational safety assessments, for various onshore and offshore facilities.

CONFERENCE PROGRAM

Please indicate which conference program your abstract relates to:

☒ Hazards Australasia

☐ Chemeca