

First ship-to-ship pilot to transfer ammonia planned for this year in Singapore

Proposed pilot follows study on the safe handling of bunkering ammonia

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Decarbonisation centre's ammonia bunkering study found that risks identified for conducting pilots were low or mitigable



THE GLOBAL CENTRE FOR MARITIME DECARBONISATION, LED BY LYNN LOO, HAS COMPLETED ITS AMMONIA BUNKERING SAFETY STUDY.

Source: Global Centre for Maritime Decarbonisation

THE [Global Centre for Maritime Decarbonisation](#) is working towards conducting the first ship-to-ship pilot to transfer ammonia in Singapore by the end of the year, according to a [statement](#).

The planned pilot follows the completion of a nine-month study by the Singapore-based group and [DNV Maritime Advisory](#), supported by [Surbana Jurong](#) and the Singapore Maritime Academy on ammonia bunkering safety procedures.

"The risks identified for conducting pilots in the port of [Singapore](#) were found to be low or mitigable, thus paving the way for a pilot project to take place at three identified sites," the centre said in a [statement](#).

Despite its toxicity and associated risks, green ammonia is one of the potential fuels that can decarbonise the shipping industry, according to the centre.

"With the completion of this study, local regulatory authorities will be able to use the report and its guidelines to deliberate the undertaking of an ammonia bunkering pilot," said chief executive Professor Lynn Loo. "This report will inform and enable a GCMD pilot involving ship-to-ship transfer of ammonia in the port waters of Singapore. We are aiming for the first transfer of ammonia to take place by the end 2023, subject to obtaining the green light from the relevant regulatory agencies.

"Since ammonia-fuelled vessels are not yet available, we will be conducting the pilot with proxy assets to gain stakeholder competence and confidence so an actual bunkering exercise can begin when ammonia-fuelled vessels are on the water."

The GCMD's study, commissioned in January of the past year, analysed capacity needs and feasible operating concepts of bunkering. It recommends suitable sites for pilots, and identifies hazards, key risks and mitigation measures.

The report also estimated the total capital expenditure for the additional infrastructure buildout needed to operationalise ammonia bunkering at two land-based sites.

For the study, the DNV consortium consulted with 22 partners and obtained feedback from more than 150 Industry and Consultation Alignment Panel members.

Conversations with relevant regulators helped refined the analyses, the GCMD added.

Given the port of Singapore's proximity to dense residential areas and operations that see more than 1,000 ships a day, the stringent guidelines to pilot ammonia bunkering that were developed in this GCMD study will likely be applicable to piloting ammonia bunkering at ports elsewhere.

More than 400 potential risks were identified and assessed based on four technically feasible operational concepts: Breakbulk and bunkering at anchorage, as well as shore-to-ship transfer and cross-dock transfer at two land-based sites for potential ammonia bunkering.

The consortium found the identified risks to be manageable with mitigation measures.

The analysis showed that individual fatality and injury risks depend on the flow rate of ammonia, the number of transfer operations, duration per transfer operation, and the length of piping and transfer arms.

Given the small number of ammonia bunkering pilots that would be carried out annually, the individual risk thresholds set by the Major Hazards Department of Singapore's Ministry of Manpower are not expected to be triggered, the GCMD said.

"Ammonia holds potential as a future maritime fuel and thus one pathway for the maritime industry's decarbonisation journey. This project will help lay the safety considerations for ammonia bunkering," said Knut Ørbeck-Nilssen, chief executive of DNV Maritime.

"Safety lies at the heart of the guidelines that DNV helped to develop for this pilot in Singapore. Further pilots and studies are key to understand, assess and mitigate safety risks associated with using ammonia fuel on board the world fleet."

In preparation for the next phase, the centre is working with Singapore Maritime Academy to operationalise the manpower development framework for training operators to handle ammonia as a marine fuel.

It is also working with Oil Spill Response Ltd to develop emergency response procedures, and will be sharing the full report with the Singapore Standards Council to support the development of a technical reference on ammonia bunkering.