

# Safety Evaluation on LNG Bunkering: To Enhance Practical Establishment of Safety Exclusion

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## Abstract

Given the recent introduction of a novel approach for establishing the safety exclusion zone during LNG bunkering by Jeong et al. (2018), this paper was to extend its investigation on the safety of LNG bunkering from the site-specific perspective. A 50K bulk carrier was selected as the case ship, which is known the first merchant ship using LNG as a marine fuel, engaged in the coastal freighter for Korean seas. The case-specific analysis was conducted in aids of computational fluid dynamics for microscale metrological/geometrical modelling and simulations. Parametric analyses were also carried out to enhance our understanding of the sensitivities of various bunking conditions pertinent to the risk of LNG bunkering, thereby providing a clearer insight towards optimal ways to minimise the risk particularly against the flash fire as well as to determine the proper level of the safety exclusion zone. The novelty of this paper can be placed on the fact that it has introduced the way to transform the ‘generally-applicable but less-reliable approach’ to ‘specifically-applicable but more-reliable one’ in terms of examining the LNG safety in the marine industry. Therefore, we can make a practical achievement which can remedy the shortcomings/shortfalls of existing technical and regulatory guidance. Overall, this effective investigation and guidance on the LNG safety are believed to contribute to overcoming the current safety challenges, thereby stimulating the smooth transition of marine fuel source from the conventional oil products to a cleaner LNG.

**Keywords:** *LNG bunkering, LNG-fuelled ship, safety exclusion zone, flash fire, gas dispersion, LNG fire/explosion*

## References

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## Biography

Dr Jeong is a Teaching Associate at the Department of Naval Architecture, Ocean and Marine Engineering, University of Strathclyde. Prior to the appointment, he was working at Korean Register as a marine surveyor and worked at Hyundai Merchant Marine Co. Ltd as a sea-going marine engineer on board a number of merchant ships.