Maritime DTU
Center for Maritime Activities

Ship-to-ship LNG bunkering at sea

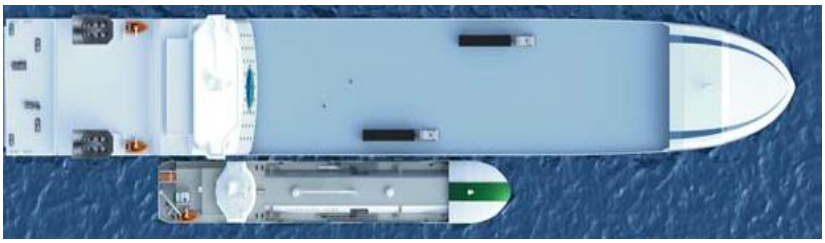
Type of project: MSc

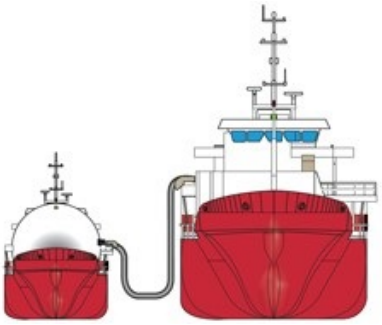
Project description:

Due to the new regulations on sulfur emissions, LNG as a marine fuel has become a more interesting alternative in the last few years and it is at a tipping point with a rapid increase in the number of LNG fueled ship (LFS) and ports offering LNG bunkering. LNG as fuel helps ships to cut sulfur emissions by almost 100%, fine particle emissions by almost 100%, nitrogen oxide emissions by around 85% and greenhouse gas emissions by around 20%. More than 250 LFSs have been contracted or operated covering all types of ships. It is also estimated that LFSs account for 30% of new global shipbuilding projects by 2020.

LNG bunkering is an inevitable process to refuel LFSs, which normally takes place at the port. It may pose a higher risk than bunkering with conventional oil products due to its low ashpoint. Initial incidents due to undesirable LNG leaks often lead to a larger chain of accidents. Ship-to-ship (STS) bunkering outside of ports has emerged as the most practical way to ensure high bunkering volumes and good access without regional restrictions and upgrading of existing infrastructures at the port.

Large relative motion between the two ships may lead to the failure of the flexible hose, which is commonly used in LNG bunkering. This project focuses on the numerical modeling of the ship-to-ship LNG bunkering at exposed sea areas. The student is expected to perform hydrodynamic analyses in the frequency domain by HydroD/Wadam and in the time domain by a SIMO/RIFLEX.





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