

Marine engines simulation – In-house or commercial tools?

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Abstract

As the size and weight of two-stroke marine diesel engines as well as their procurement, running and experimental testing costs are enormous, various engine modelling techniques have been extensively used for investigating the engine steady-state performance and transient response, for testing various engine designs as well as for developing the engine control system. In this lecture will provide insight to the modelling of marine engines by using both in-house and commercial software. The presented case studies include: turbocharger cut-out vs. blower activation in large two-stroke engines, application of variable geometry turbine in four-stroke marine engines, mapping of the ship propulsion system performance and emission parameters, dual-fuel engine optimisation for reducing CO₂ and NO_x emissions. Based to the presented results, the advantages and drawbacks of the simulation tools will be discussed.

Keywords: *marine engines, simulation tools*

Biography

Gerasimos Theotokatos - NAOME Dept. University of Strathclyde, DNV GL Reader of Safety of Marine Systems, Deputy HoD. His research focuses on the various methods of modelling, optimisation and experimental analysis of marine systems and ship energy systems pursuing life-cycle efficiency improvement, reduction of their environmental footprint and enhancing of their safety, promoting feasible, safe and green design/operating alternatives that can meet the demanding marine industry requirements.