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Design-side Innovation to Minimize the Environmental Footprint of Ro/Pax Ferry

Presentation at the RINA "Power and Propulsion Alternatives for Ships" conference

Donald MacPherson, Technical Director of HydroComp, Inc. Durham, NH USA, in cooperation with Greek partners NAP Engineering, HELENGI Engineering, and Blue Star Ferries, recently presented the design of the new LNG-fuelled vessel by Blue Star Ferries at the conference "Power and Propulsion Alternatives for Ships" organized by The Royal Institution of Naval Architects in Rotterdam, the Netherlands. This design work and analytical studies are included in the framework of the "POSEIDON MED II" program, which promotes the use of LNG as marine fuel in the Eastern Mediterranean Region and which is co-funded by the EU.

The overall length of the Ro/Pax ferry will be 145m, its normal passenger capacity 1400, and carrying capacity 1000 lane meters. Moreover, the vessel will comply with SOLAS, Safe Return to Port and IGF Code Rules and Regulations. The comprehensive design of the ship was completed by the partners of the program and has already received "Approval-in-principle" from Lloyds Register.



Special attention was made during the presentation of innovative work developed by HydroComp for hull form hydrodynamics, duty profile analysis in dual-fuel operation, and prediction of CO₂ greenhouse gas production. New capabilities in HydroComp's NavCad software were applied to predict resistance using its ADVN analytical method, as well as to identify a "longitudinal wave source" distribution whereby the influence of local hull form shape can be evaluated for its contribution on resistance. This information was applied during design to reduce hull resistance by some 10% with appropriate modification of stern characteristics. The modified design with an alternate dual-fuel (MDO-LNG) engine ultimately achieved a 14% reduction in total propulsion energy demand and a 34% reduction in CO₂ production.

About HydroComp

HydroComp provides software and consulting services for resistance and propulsion prediction, propeller sizing and design, and forensic performance analysis. HydroComp is proud to have served over 700 industry, research, academic, and government clients from more than 60 countries for over 30 years.

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