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Comparative Study of Hydrodynamic Performance for Site-Specific Optimal Designs of Catamaran and SWATH

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Due to the request of energy source diversity, in addition to traditional oil/gas exploitation offshore industry has started to outspread to different energy areas such as gas hydrate and renewable wind energy in open sea. Foreseeably, as the demands of clean energy become more and more ardent under the pressure of environment protection, the offshore activities will extend more to renewable energy development. The recent years' rapid increases of offshore wind farms in North Sea and East China Sea are two representative examples.

In this paper, two typical ship types commonly used for offshore service activities, namely Catamaran and SWATH (Small Waterplane Area Twin Hull), are focused to compare their hydrodynamic performances in a specific site - East China Sea. Optimizations of the hulls for both Catamaran and SWATH to minimize their resistances in clam water and seaway conditions are performed and using the available wave scatter diagram of East China Sea, the hulls are further revised to fulfill the best sea-keeping performance characteristics. Through the comparisons of the optimal designs, this paper attempts to provide a detailed procedure to guide the concept design for ship type selections of offshore vessels operating in site-specific conditions.

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