



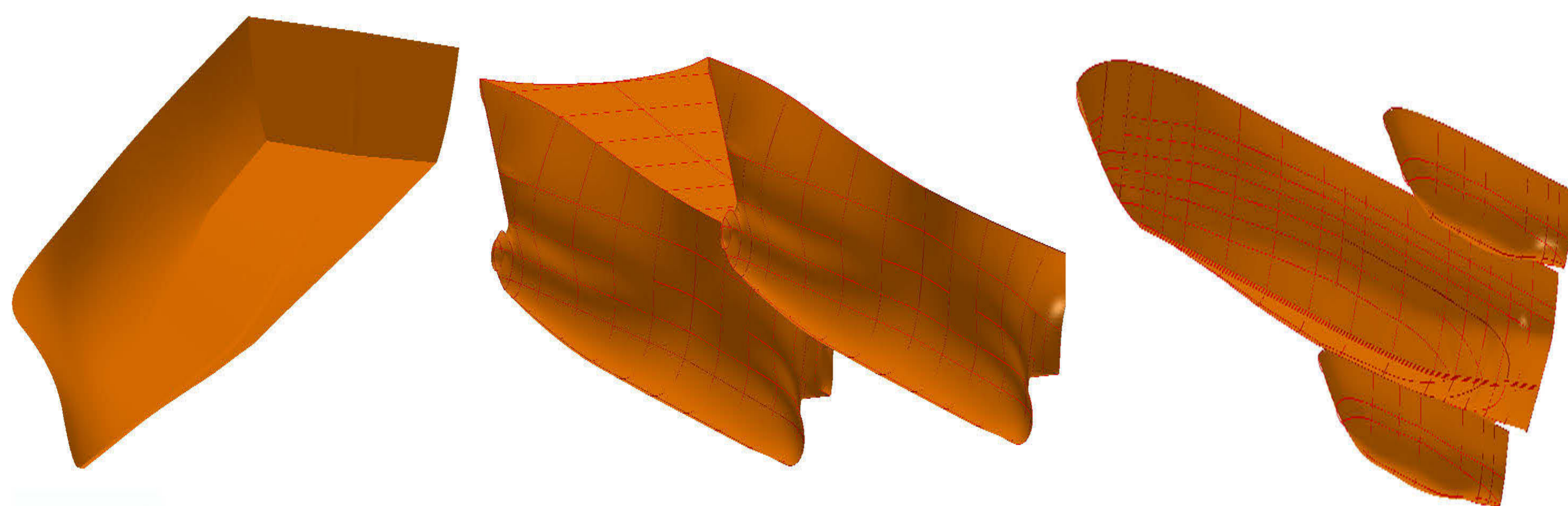
Abstract

Due to the offshore wind farm is often influenced by wind, wave, flow and tidal effects, it is necessary to study the performance of wind power operation and maintenance ship to provide a safe, economic and efficient sea transport for operation and maintenance, so as to improve the operational efficiency and effectiveness of offshore wind farm. Offshore maintenance vessel for wind farm should be equipped with fast sailing, good seaworthiness and so on, and its performance is mainly determined by its ship form scheme.

Objectives

In this paper, a preliminary study is carried out on the ship form scheme of monomer, catamaran and trimaran and their performance, in order to provide some reference for the selection and application of operation and maintenance ship for wind farm.

Methods



1:As for monomer, in order to further explore the round & knuckle ship type resistance performance, This paper designed and constructed a high speed operation and maintenance mono-hull ship, based on the analysis of relative length of operation and maintenance mono-hull ship for wind farm with different angle lines.

2:As for catamaran, based on the conventional catamaran, this paper take the advantages of the small waterline area twin hull ship, and adopt the relative length of the larger bulbous head and stern ship to obtain excellent resistance and seakeeping performance.

3:As for trimarans, this paper set the ratio of side hull displacement to total displacement was 9%, 12%, 15% and 18% respectively, to explore the scheme of low resistance.

Results

1:As for monomer

ITEMS	Round bilge hull	Round bilge angle 1	Round bilge angle 2	Round bilge angle 3	Round bilge angle 4
relative length of angle	0%	10%	15%	20%	30%
resistance coefficient	1.022×10 ⁻²	1.014×10 ⁻²	1.008×10 ⁻²	1.012×10 ⁻²	1.016×10 ⁻²

2:As for catamaran

SHIP TYPES	Conventional catamaran	catamaran with big bulbous head and stern
Total resistance (KN)	53.6	38.2
Residual resistance (KN)	37.46	23.28
Frictional resistance (KN)	16.16	14.94

3:As for trimaran

Ratio of drainage volume	9%	12%	15%	18%
resistance (N)	49.134	49.428	51.816	50.954

Conclusions

1: Round & knuckle craft has both round bilge hull excellent resistance performance, and the good rolling performance of knuckle type.

2: The ship form of the catamaran with big bulbous head and stern resistance performance is significantly higher than that of conventional catamaran by using CFD numerical simulation method.

3:For trimaran, the proportion of the displacement of the side body and the relative position of the main body has an important influence on its performance.

In view of Chinese offshore wind farm has begun to take shape and have been put into operation in succession, the demand for maintenance ships is also becoming more and more urgent. Several types of ship types explored in this paper can provide some help for the selection of maintenance ship.

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