ABSTRACT

This study proposes an early stage design tool to find the main particular of high speed ro-pax aluminum catamaran based on the ship payload. This was accomplished by compiling a product database of twenty five existing high speed catamarans for the development of relationships between ship characteristic parameters. The relationships are analyzed using spread sheet (Microsoft Excel, 2010). Because of the scatter of the data, mean values (trend line) have been plotted on graphs and relations were presented in equations. These proposed relations can be used as a tool to predict ship main parameters in the preliminary design stage. The results are compared with other method and existing ship parameters to validate the proposed relations.

This thesis highlights the most important design considerations of high speed catamarans in the preliminary design stage, such as selection of building material, stability, resistance, powering and safety considerations.

A comparative study was done to estimate the difference in hull weight of such ships using two different materials, namely, steel and aluminum. It was found for the case study in this thesis that the aluminum hull weight is about 0.42 of the steel hull weight. This fact will affect the vessel operation, powering, fuel consumption, payload, ….etc.