Full Scale CFD Simulation of Azipod Unit Performance at Varied Steering Angles

[1]

ABB Marine is using STAR-CCM+ for the Azipod-units CFD simulation. In this study, open water performance of the pod unit and simulated hydrodynamic loads at varied steering angles at full scale are presented. Open water performance of the pulling-type propeller and pod unit are determined by three approaches: RANS CFD simulations by quasi-steady moving reference frame and unsteady sliding mesh approaches and by model scale experiments for validation. The sliding mesh technique is applied for capturing hydrodynamic loads on the pod and propeller surfaces at varied steering angles. These loads are further utilized in the strength analysis. In this analysis, SST (Menter) k-w turbulence model and STAR-CCM+ versions 7.06.009 and 8.02.008 are used. New feature introduced for the latter version, namely parts-based meshing is also utilized in the simulations.

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