

Title: Unique full-scale bollard pull test of large DP vessel newbuilding with six Azipod® CZ thrusters

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Abstract

Six Azipod CZ980 thrusters were selected for an accommodation/work barge. As per Figure 1 below the thrusters were to be installed in a triangle formation with three in the stern (Pods # 1-3) and three in the bow (Pods # 4-6). In the original technical specification the thruster power was 1.8MW and bollard pull requirement was 30 tonnes per thruster. During the project phase ABB conducted Computational Fluid Dynamics (CFD) analysis to verify thruster requirements. The CFD analysis concluded that a thrust deduction of 3-4% could be expected for the side thruster in the stern and the bow.

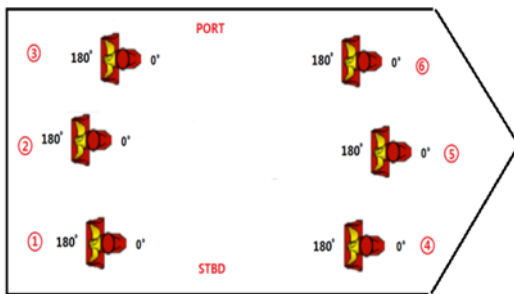


Figure 1 – Thruster Configuration

As a result of these tests and analysis it was decided to increase the thruster power of each Azipod CZ980 unit to 1.9MW. Using reference data from previous open water test with pods of similar power and propeller geometry the expected thrust without any thrust deduction would be 34.5 tonnes. With a 4% thrust deduction the side thrusters should be able to produce 33.4 tonnes of thrust.

This paper will compare the data from the performed bollard pull test with the calculated data from the CFD analysis. The aim is to better understand the impact on delivered thrust based on the specific thruster configuration and test conditions. A better understanding of these factors leading to thrust deductions can be used to further enhance modelling on future projects.