

**Title:** DP Capability of Tilted Thrusters

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**Abstract**

In this paper the results of full scale numerical simulations of the flow through a thruster unit and along a drill rig are presented. The development process of the numerical CFD (computational fluid dynamics) methods will be discussed briefly. The numerical simulations are used to determine the full scale thruster performance of a conventional straight thruster unit and a 8-degree tilted thruster unit. In the next steps the thruster-hull-interaction and thruster-thruster-interaction effects of both types of thruster units have been determined. From the various CFD calculations thrust-deduction factors have been derived, depending on the location on the vessel and the type of thruster unit. The derived thruster-interaction factors for single units have been combined to determine the available thrust for a drill rig with 8 units.

The results for the straight and tilted units are presented in polar plots to indicate the clear benefits of the tilted thruster units. For the presented example case the maximum increase of available thrust of the rig in side way operation is about 35%. In forward operation the gain in available thrust is 9%.

The improved vessel performance is attributed to the significantly reduced interaction losses with the hull and with other thruster units. Due to the tilted units, the jet out of the thruster is deflected sufficiently downwards to avoid the interaction with the hull.

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