

Title: Voith Schneider Propeller - An Efficient Propulsion System for DP Controlled Vessels

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Abstract

The Voith Schneider Propeller (VSP) offers a very fast and precise thrust control. The thrust is produced by rotating and additionally oscillating blades. The thrust is controlled by means of a kinematic gear and a control rod. The thrust follows the motion of the control rod immediately via an X/Y-logic. That means, the thrust can “over zero” steered in any direction very fast. The very fast and precise thrust control offers an efficient force for the DP-system of the ship.

The faster the propulsion system can counteract a disturbance created by environmental forces the less energy is necessary to keep the vessel in the relevant watch circle.

The paper presents the latest results of studies on the Voith Schneider Propeller in dynamic positioning applications. These investigations have been carried out by using experimental methods and computational fluid dynamics. Studies were conducted on the influence of the Voith Schneider Propeller on stern slamming conditions, the roll damping capabilities of the VSP and the impact of air ventilation. For the latter the results are compared to azimuth thrusters.

The results show that the VSP has an alliviating impact on pressure loads due to stern slamming.

The VSP influences positively the slamming behaviour of a vessel because of its vertical rotating axis. Furthermore the VSP is less prone to thrust losses due to ventilation effects compared to thruster- type propellers. Additionally the Voith Schneider Propeller can be used to reduce the roll motion of the vessel. The necessary logic, called Voith Roll Stabilization, can be combined with the DP system of the vessel and the steering system, including the auto pilot.

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