

# ‘Pods in Service’

**In the last few years there has been a breakthrough in the application of podded propellers. Report outlines the short history of the Joint Industry Project ‘Pods in Service’ and looks at its contribution to future design.**

Starting at the end of 1999, this particular JIP, ‘Pods in Service’ was initially created in a bid to assess and evaluate the reliability of design models for podded propulsors, under operational conditions.

Despite the fact there was a revolution in the design of podded propellers recently, more information was always needed on the design loads and design specifications for podded propulsors in service as these devices differ significantly from conventional propulsors and rudders. Therefore, the ‘Pods In Service’ Project was initiated and it is set to be completed within three years.

## **Measured data**

To achieve the objectives, extensive monitoring campaigns on board four vessels with different pod systems have been conducted. Extensive measurements have been carried out on the four (an older vessel and three new-built vessels). All of the vessels involved are now in service and full-scale measured data is being collected and analysed.

The vessels concerned include two cruise liners, one ferry and an ice breaker/supply vessel. The latter vessel, BOTNICA, which has ABB azipods, is operated in the Baltic and North Sea by the Finnish Maritime Administration. One year of data has already been collected and this is now being analysed.

Entering service last summer, the cruise liner RADIANCE OF THE SEAS, is also powered by

## initiative provides invaluable data

ABB azipods and operated by Royal Caribbean International. The second liner, the SUMMIT, which is powered by Kamewa Mermaids, is operated by Celebrity lines. The cruise liner vessels have been built by Meyerwerft in Papenburg and Chantiers de l'Atlantique in St. Nazaire respectively. NILS HOLGERSSON, the ferry, is powered by Siemens Schottel SSP units and is operated by TT Lines. This vessel was built by SSW in Bremerhaven.

Significant data sets from these vessels have been collected. The measurements concentrate on the loads on pod and hull structure and help derive operational, extreme and fatigue loads and vibration levels. A combination of long-term, low frequent and periodic high frequent measurements produce several gigabytes of information per ship each week.



### First reports issued

The measurements cover a wide variety of information varying from the ships operational parameters such as draught, speed and position to the pressure fluctuations above the propellers, the stresses and accelerations at a number of locations and the environmental conditions.

After installation static load tests were performed in dry dock. In these tests a 50 tonne load was applied in the various directions to relate measured strains to the loads. The first measurements were taken during the official speed and manoeuvring



trials. After that the measurements continued unattended. Data measured so far, is being analysed and the first reports on propeller-induced hull pressures and static strain measurements as monitored during the sea trials have already been issued. To evaluate the vast amount of data and based on the current analysis, standardised data reduction procedures will be set-up for unattended on-board data analysis in order to allow real long-term measurements, without overloading the data storage capacity both onboard and at MARIN.

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The analysed results will be compared with scale model test results and computational analysis. Five classification societies are involved in the computational analysis to evaluate computational methods for determining pod and ship loads in the design stage. [MARIN](#)

'NILS HOLGERSSON'

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