

# Podded propulsion, a novel propulsion type providing new hydrodynamic challenges

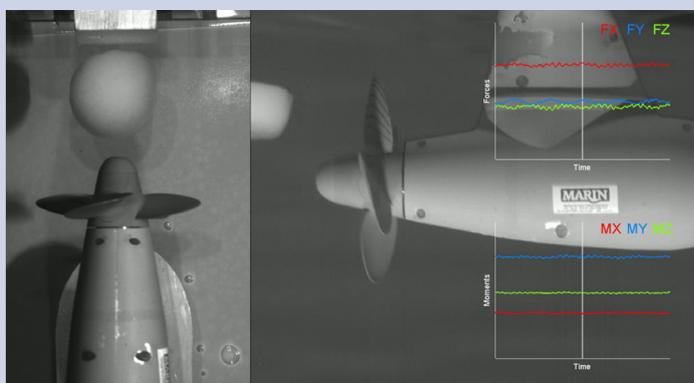
CRS pioneers podded propulsion research throughout the decades

In the mid-nineties, a novel propulsion type made its appearance in the maritime market – podded propulsion. The first installations were on ice-going vessels, but a few years later, the cruise shipbuilding industry followed. Initially, the advantages of more freedom for the inner layout and improved comfort, with even better efficiency resulted in the rapid introduction of several pod designs by different manufacturers.

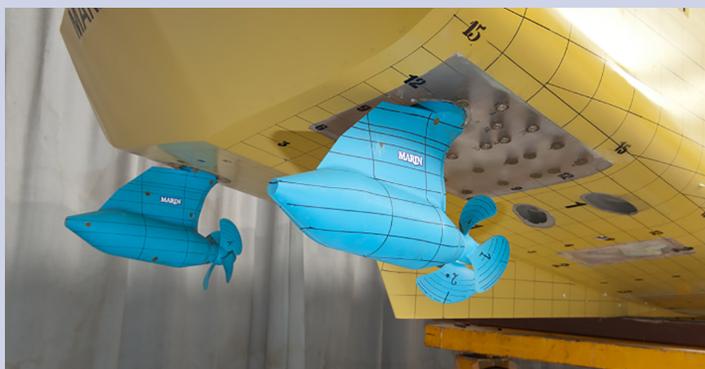
However, with the first vessels being delivered successfully, new questions came back from the yards and ship operators. The success also made it clear that the potential of this new propulsion type was not fully understood. Within the CRS the proposal for the first POD Working Group was awarded in 1999, followed in typical CRS tradition by POD-2. The research was focusing on how the pod had to be integrated into the ship design from a hydrodynamic point of view. Feasibility studies were carried out on various ship types, from cruise liners and ferries to a shuttle tanker.

Even fast vessel concepts, with large vessels operating with pods at speeds of 38 knots were investigated in the MONOFAST working group. Although these concepts were never built, they were important for the development of knowledge on podded propulsors. Besides powering and comfort, the merits of podded propulsion for the crabbing performance of passenger ships were discovered.

After 10 years of general design knowledge built up on pods, the research became more focused on the loads on the pods and their propellers. For the 'Loads on PODS' working



Force due to ice impact at the instantaneous point in time as indicated by the white line in the time series showing the three force and moment components



group a 6-component balance was developed to measure the forces and moments in 3 different directions on the propeller during its operation. The main focus of the work was on how these loads changed during the steering of the pod unit and what the forces would be at the bearings. In the PROPOLAR working group, this same sensor was used to measure the single impact of an ice block on a single blade. For various EU projects and JIPs such as the CD-series and the TT JIP, the groundbreaking work of CRS provides a knowledge base. □