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MARITIME REPORTER AND ENGINEERING NEWS

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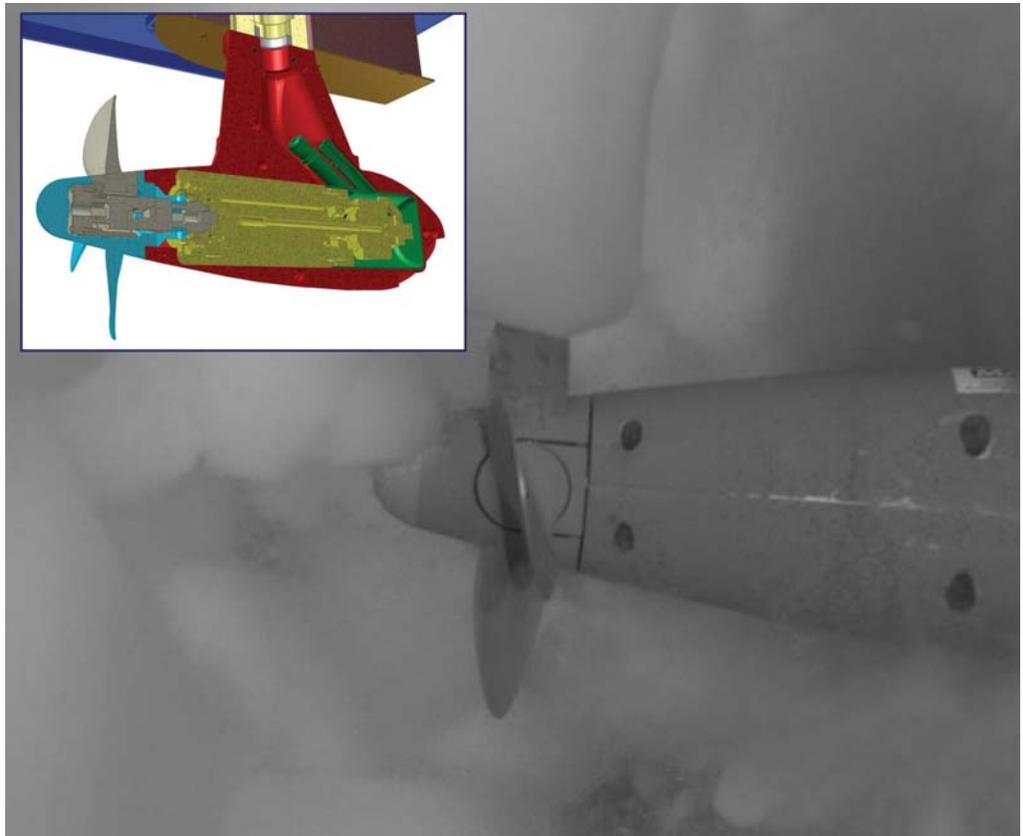
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Ice loads on the propellers of pods are the focus of one of the “Cooperative Research Ships” working groups, organized by MARIN. Aiming to develop a mathematical model to determine the ice loads on podded propulsors, this particular project faced some specific challenges.

Today, the CRS consists of 25 member organizations and companies carrying out a joint work program, sponsored equally by all members. In principle the research is carried out by the members only. The research results are the sole property of the members.

The CRS ProPolar work group is a continuation of the Loads on Pods work group, which addressed the hydrodynamic loads of podded propulsors. To determine the ice loads on a propeller, the model test setup had to be capable of measuring the impact of an ice sheet or ice piece on an 18 cm propeller by means of measuring the highly dynamic forces and torque in all directions. To achieve this, one single lightweight aluminum blade was mounted on the six-component force transducer used in Loads on Pods. The other propeller blades were mounted directly on the shaft.

The ice tests were carried out in cooperation with AARC of Helsinki in its hi-tech ice tank. Since ice testing is a costly business, highly detailed preparations were carried out to ensure a successful measuring campaign during the two ice days that were available.



With the ice pod test setup the following test series were carried out:

- Milling through a 4 cm thick ice sheet
- Milling through a 40 cm thick ice ridge

Synchronized, high-speed video recordings were made from some tests, which gave a unique insight into the propeller ice contact and the corresponding loads. With this test series, which were measured by MARIN, an excellent data set was successfully obtained on unsteady propeller ice loads. The newly developed model test setup elements have proven their merits and are more than ready to be applied in other ice projects.