A Practical Design Approach including Resistance Predictions for Medium-speed Catamarans
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Rate Dependency in Conical Ice Indenter Failure
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Towards Safer Container Shipping
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4  A Practical Design Approach including Resistance Predictions for Medium-speed Catamarans

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Medium-speed catamarans are under development as a new class of vessels to meet requirements for highly efficient sea transportation with low environmental impact. Reduced service speed and increased deadweight will increase transport efficiency. Compared to current high-speed catamarans, these new vessels will operate in a transitional speed range between high-speed craft and conventional displacement ships. In this paper, design guidelines to choose appropriate main dimensions for medium speed catamarans with minimum resistance were derived and a preliminary design was made. These vessels will operate at Froude numbers of about 0.35 and have a relatively low prismatic coefficient of about 0.5 in conjunction with a small transom immersion. Different methods are discussed to correctly predict the calm water resistance, with RANSE (Reynolds-averaged Navier-Stokes equations)-based flow simulations being the most promising. It is shown that they are capable of predicting the hydrodynamic characteristics of medium-speed catamarans, such as drag force, trim and sinkage with acceptable accuracy.

14  Rate Dependency in Conical Ice Indenter Failure

By Anna K. Dillenburg

Research of the properties of the material ice and ice-structure interaction are important for design of ships and offshore structures, because resource extraction, transportation links and tourism move north into the Arctic. Experimental benchmark tests have been conducted within the Sustainable Technology for Polar Ships and Structures (STePS²) group project at the Memorial University of Newfoundland (MUN) in Canada to examine the rate dependency of conical ice indenter deformation and failure behaviour in the ductile, ductile-to-brittle and brittle ice deformation regime. The final objective was to develop a baseline curve and a database indicating rate dependent changes in peak load and failure mechanism of ice cones crushing into a steel structure. Additionally temperature and crushing depth effects were examined. The paper summarizes the results, which correlate well with other available data and extends the database for conical ice test specimens.
Towards Safer Container Shipping
By Vladimir Shigunov, Helge Rathje & Bettar El Moctar

Casualty statistics show that container loss in heavy weather is an important issue for innovative container ship designs. The paper describes research activities at Germanischer Lloyd aiming at the reduction of cargo losses. One example is ship-specific operational guidance, assisting the ship master to avoid excessive motions and accelerations in heavy weather. Another example is the definition of design accelerations, underlying the operational guidance. The study includes the effects of container flexibility, not addressed explicitly in the present classification rules.