

# JIPs contribute to safety at sea

**In 1999 the “NEREUS” and “HARDER” Joint Industry Projects were initiated and funded by the European Commission under the Fifth Framework Programme. Both projects are part of the European Thematic Network “Design for Safety of Ro-Ro Passenger Ferries” (SAFER EURORO).**

NEREUS focuses on the harmonisation, development and dissemination of advanced design tools to assess the survivability of Ro-Ro vessels. Recently, MARIN built a 1:20 scale Ro-Ro model (length 8 m) with midship side damage. Following the Stockholm Agreement procedures, model tests were performed in various beam sea conditions to identify capsize boundaries. In addition, the influence of transient flooding following damage has been studied in calm water and in waves. Results will be used by project participants to validate their computer models, including MARIN's nonlinear time domain FREDYN program aimed at predicting ship response under progressive and transient flooding. Through comparisons with a smaller scale model, possible scale effects will be evaluated.

HARDER aims at a systematic investigation of the validity and robustness of harmonised probabilistic damage stability regulations for various types of cargo and passenger ships. In addition, it investigates the impact on the safety of existing ships and on the design evolution of new ship concepts. MARIN's contribution is to perform model tests with a passenger Ro-Ro and Capesize bulk carrier in damage condition, focusing on transient and progressive flooding aspects. Recently, Ro-Ro tests were performed with a 1:40 scale model in the new Seakeeping and Manoeuvring Basin. The midship side damage was created to flood the model in different beam seas conditions, showing the transient behaviour from intact to damaged condition, sometimes leading to capsize.

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Damage stability test for a  
Passenger-RoRo vessel in beam  
seas (EU HARDER project)