

**NATIONAL TECHNICAL UNIVERSITY OF ATHENS
SCHOOL OF NAVAL ARCHITECTURE & MARINE ENGINEERING**

**INVESTIGATION ON THE DAMAGE
STABILITY OF ROPAX & PURE
PASSENGER SHIPS & FLOODING
SIMULATIONS**

**ABSTRACT
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The main purpose of this diploma thesis was the assessment of passenger ships' damage stability by modern design and simulation software tools, namely not exclusively via the examination of current SOLAS regulations; moreover, it was within the scope of this thesis to investigate the behavior of the vessel during the flooding process and the anticipated time to sink/capsize. A ROPAX and a Pure Passenger Vessel, of the same size and capacity, were comparatively evaluated against the requirements of the current SOLAS and European regulatory framework on damage stability. Furthermore, the drastic negative impact of open left watertight doors on the attained subdivision index A for the ROPAX design was demonstrated. Finally, comparative numerical flooding simulations were performed for the ROPAX as well as for the Pure Passenger ship, in order to more carefully investigate the progressive flooding to intact compartments, as well as their overall survivability behavior, as resulting from the formal compliance with current rules and from numerical simulations. It was shown that the Pure Passenger Ship has had superior survivability compared to the ROPAX of the same size and capacity, what confirms the findings of other similar studies. All calculations and simulations were done by use of the NAPA® software platform.