

## Challenges in the Assessment of Harbor Tranquility-Case Studies from Harbors in the Persian Gulf and Oman Sea

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### **Abstract**

*Construction of the new ports and harbors is very essential in the development of the coastal zone and also provides opportunities to promote the economics of the further inland neighboring area. One of the key issues in the planning and design of these infrastructures is providing an adequate layout to ensure a safe sheltered area for the navigation and berthing of the vessels accommodated in the harbor. To achieve this goal, analysis of wave agitation inside the harbors should be conducted in the design stage, which can be implemented by employing physical models or numerical models. But both of these tools have their own advantages and disadvantages. Another challenge in the assessment of the harbor tranquility is to define adequate criteria to ensure that the harbor is operational while frequent storms are happening and that the penetrated waves into the harbor during rare events do not cause any damage to the vessels and other facilities in the harbor. In this paper, the tools and criteria applied in the design of the majority of harbors in the Persian Gulf and Oman Sea are discussed and recommendations from the applicable standards are reviewed. The layout of two harbors – one in the Persian Gulf and the other one in the Oman Sea – are revisited by implementing a numerical model. This study reveals that one of the main design defects led to the inadequate layout for these harbors is defining the inadequate criteria for the harbor tranquility.*

Keywords: Wave agitation, Calmness, Numerical modeling, Physical modeling, MIKE 21, Boussinesq wave module.