סמינריון

הנך מוזמן/ת להרצאה סמינריונית של הפקולטה להנדסת מכונות שתתקיים ביום ה' 07.10.21
(י' בחשוון, תשפ"ב), בשעה 14:00 באמצעות הזום : https://technion.zoom.us/j/97500378870

מרצה : רואי גפטר

מנחה : פרופ'ח נתאי דרימר

על הנושא:

A feasibility study of a new concept of VLFS

The seminar will be given in Hebrew

תקציר ההרצאה :

Moving out to open sea may provide considerable relief from the over exploitation of the land and natural resources of the coastal regions. Very Large Floating Structures (VLFS) is an environmentally sensitive technology that can form artificial land at sea. Our research develops a new type of VLFS: The Delta. Designed to withstand Mediterranean open-sea conditions, the Delta provides broad operational area, and a year-round, all-weather, operability. An important feature is the formation of a sheltered basin, providing accessibility in most weather conditions. The research exams the engineering feasibility of the Delta, focusing on the hydrodynamic and structural design aspects. This stage is essential in the implementation of a new concept of a giant open sea structure.

The challenges presented by the structural analysis of the Delta are derived from its unique shape, extreme dimensions, and the practically infinite possible wave load scenarios. Unlike traditional marine structures, which are applicable to design classification rules, the design of the Delta must rely on a first principal approach and direct analysis.

We established an analytical procedure for the fast assessment of the primary strength requirements. This design tool enables fast scanning of hundreds of combinations of sea states and identifying the critical combinations. Furthermore, it led us to improve the geometry and reduce loads and load effects. Following shape optimization, we reanalyzed the hydrodynamic aspects (mooring conditions in the basin, sea keeping, anchoring loads). The next stage of the research was the rigorous evaluation the structural design by a combined BEM-FE analysis, where we pinpointed the critical waves and evaluated the design in terms of equivalent stress and structural instability multipliers (buckling). Buckling is typically the critical manner of failure for stiffened-plates structures as large marine hulls.

In view of the design aspects that we evaluated by means of self-developed and commercial software we conclude that the Delta is feasible and promising and recommend to carryout laboratory tests in a large offshore wave basin.

בברכה,

פרופ"ח אתי סאס

מרכז הסמינרים