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Limiting environment determination for an offshore vessel

The design of an offshore vessel requires the combination of multiple aspects typical of naval architecture and marine engineering. Between them, the definition of environmental loads and excitation is relevant, since it is required to evaluate motion operability, dynamic positioning capability and structure dimensions. These three topics traditionally refer to independent analyses and are treated in separate design stages. Moreover, the techniques and the calculations performed to assess the performances of the vessel under design differ topic by topic, referring to different limiting environmental conditions. This paper presents a comparison between the different limiting environment determination for the assessment of ship motion, dynamic positioning and maximum design loads for structures. In particular, advanced analysis methods are applied on a reference vessel to highlight the differences between station keeping, sea keeping and structural loads limiting environment. A combined representation of station keeping and seakeeping data is then used to compare the vessel operability issues with recommended design loads.

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