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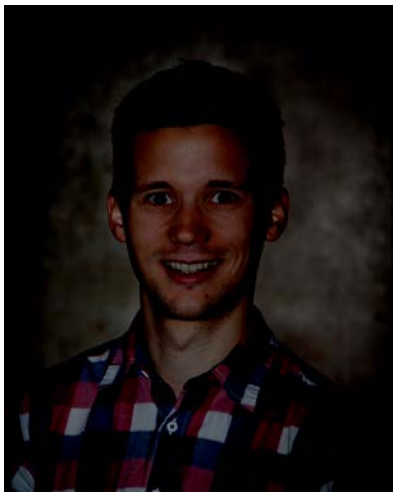

Title:
Hydrodynamic loads on complex structures in the wave zone

Short ingress:
The purpose of the PhD work is to provide enhanced knowledge about hydrodynamic loads on complex structures during deployment. This includes performing new benchmark experiments for hydrodynamic loads in the wave zone. The end goal is to develop rational methods for load estimates on complex structures.

Industrial goals:
Rational methods to calculate hydrodynamic loads on complex structures need to be developed to ensure proper load estimates for marine operations involving, among others, the replacement of complex modules for subsea installations. Experience show that planning of marine operations is of high importance. Load predictions in terms of rational load models are necessary in this respect. Rational methods have been developed for simpler geometries, but there still exists knowledge gaps on several fundamental issues as well as large uncertainties in the hydrodynamic load estimates for more complex structures.
The present research will focus on hydrodynamic loads on 2D and 3D structures in the wave zone - as the structure goes into water - with regards to off-the-side (crane) operations. Moon pool operations and loads as the structure is further submerged and lowered to its seabed destination may also be relevant.

Scientific questions:
- Is it possible to accurately estimate hydrodynamic loads on complex structures?
- Which effects dominate the load response at different stages during deployment?
- How can rational models be simple and fast to use, and at the same time take into account the complexity of subsea structures?
- How can the current recommended practices be improved to increase accuracy of load predictions for complex structures?

Innovations:

Increased knowledge on hydrodynamic loads on complex structures in the wave zone can contribute to innovations and new solutions for offshore marine operations. This includes increased predictions of hydrodynamic loads that can be used for development of software, calculation methods, operational window predictions and new solutions for lowering of structures through the wave zone. In addition to potentially increasing the operability and reducing cost, research findings may also contribute to increased confidence in training and planing of marine operations.

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