

NTNU-CSC PhD Scholarship:

Dynamic response of pipelines and cables under operational condition

Type of scholarship: PhD scholarship

Period of the scholarship: 01 October 2021 – 30 September 2025

Short description of the scholarship:

Subsea power cables represent critical infrastructures for both oil and gas and offshore renewable energy sectors. The existing subsea pipeline network for transportation of oil and gas will further have a future potential to be reused for transportation of the captured CO_2 as part of the emerging industry of carbon capture and storage (CCS). Structural integrity and safety of pipelines and power cables is essential to the success of both renewable energy and CCS.

The present PhD focus on the development of more accurate models for predicting the dynamic response of both pipeline and cables resting on the seabed as a basis for supporting the above industries with improved models that are applicable both during engineering and life reassessment of existing infrastructures. The problem involves non-linearities introduced by hydrodynamic loads, structural behavior and pipe-soil interaction phenomena. This requires both advanced numerical models and experimental test data as a basis for calibrating these models.

The research project will mainly focus on following topics:

- Dynamic response of pipelines and cables at free span with combined Morison and wake models.
- The application of existing experimental test data to address the dynamic response of pipeline/cables with small diameter.
- Soil-pipe interaction at shoulder of free span by Coupled Eulerian-Lagrangian (CEL) method

Qualification and requirement:

- The PhD-position's main objective is to qualify for work in research positions. The qualification requirement is completion of a master's degree or second degree (equivalent to 120 credits) with a strong academic background in, e.g. Naval Architecture, Ocean & Marine Engineering and Marine Technology with a grade of B or better in terms of NTNU's grading scale.
- Preferred selection criteria
 - The candidate should have a background, and practical experience, with at least two of following fields:
 - ✓ Structural dynamics and hydrodynamic
 - ✓ Stochastic analysis method
 - ✓ Advanced numerical simulation (FEM/CFD)
 - ✓ Programming and development of software
 - ✓ Geotechnics, especially pipe-soil interaction

In addition, for all applicants the following applies:

- Fluent English language, both written and spoken with certificates of TOEFL minimum 95 or IELTS minimum 6.5
- Chinese citizenship documents (copy of his/her passport or national ID of P.R. China)
- CV
- A motivation letter

Deadline for submission of application: 15th Feb 2021

Scholarship: 17000 NOK/month for a period of up to 48 months

According to the NTNU-CSC agreement

CSC will provide a living stipend, currently 12,500 NOK per month for a period of up to forty-eight (48) months, and a round-trip international airfare between China and Norway. NTNU will provide a monthly additional funding for a period of up to forty-eight (48) months, which combined with the CSC living stipend ensures the sufficient income (currently minimum 17,000 NOK per month) required by NTNU. No tuition fees will be charged for PhD candidates at NTNU.

Supervisor info:

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