Jobbnorge ID: 259654
Deadline: 4/14/2024
Website: http://www.ntnu.no
Scope: Fulltime
Duration: Temporary

The Department of Mechanical and Industrial Engineering has a vacancy for a

PhD Candidate in fatigue and fracture assessment of pipeline steel in presence of Hydrogen gas

This is NTNU

NTNU is a broad-based university with a technical-scientific profile and a focus in professional education. The university is located in three cities with headquarters in Trondheim.

At NTNU, 9,000 employees and 43,000 students work to create knowledge for a better world.

You will find more information about working at NTNU and the application process here.

Video: https://youtu.be/Xt-yHCN5QS0

About the job

For a position as a PhD Candidate, the goal is a completed doctoral education up to an obtained doctoral degree.

HyLINE II project:

The subsea pipeline network on the Norwegian Continental Shelf (NCS) is increasingly being recognized as an opportunity for the large-scale transport of hydrogen from Norway to Europe. Utilizing existing natural gas pipelines for transportation of hydrogen gas brings several challenges, especially the risk of hydrogen embrittlement. Ensuring the safety of hydrogen transport relies on understanding its impact on pipeline materials. Recent findings from the RCN project HyLINE (2019-2023) highlight that while hydrogen adversely affects the mechanical properties of investigated pipeline steels, they may still meet existing design standards. However, the heat-affected zone of welds appears to be more vulnerable. To address this gap, HyLINE II will focus on the material integrity of welded joints in subsea hydrogen pipelines, examining their impact on overall pipeline integrity.

PhD project:

Your research is expected to cover experiments, theoretical work, and partial numerical simulation. Main focus will be placed on the material characterization of pipeline steels (base material and weldment) in presence of Hydrogen gas post-mortem analysis of tested specimens for understanding the failure mechanisms. Your research will also support establishment and modification of innovative experimental approaches for characterization of fatigue/fracture-hydrogen interaction in pipeline steel alloys of the project.

Your role will provide ample opportunities to interact and collaborate with fellow technologists and scientists within mechanical engineering and material science.

This position is financed by the Research Council of Norway's Knowledge-building Project for Industry, on Safety and Integrity of Hydrogen Transport Pipelines (HyLINE II) in a collaboration between SINTEF, NTNU, Kyushu University and industrial partners Equinor, Gassco, Total E&P, TechnipFMC, Tenaris and Shell.

Your immediate leader is Associate Professor Nima Razavi.

Duties of the position

- performing mechanical characterization (such as tensile, fracture and fatigue tests)
- microstructural analysis of the pipeline alloys used in the project
- application of advanced damage detection methods for structural integrity assessment
- application and development of local approaches for fatigue life prediction
- write and defend a PhD thesis
- take part in the mandatory PhD research education programme

Required selection criteria

- you must have a professionally relevant background in mechanical engineering or material science
- your education must correspond to a five-year Norwegian degree program, where 120 credits are obtained at master's level
- you must have a strong academic background from your previous studies and an average grade from the master's degree program, or equivalent education, which is equal to B or better compared with NTNU's grading scale. If you do not have letter grades from previous studies, you must have an equally good academic basis. If you have a weaker grade background, you may be assessed if you can document that you are particularly suitable for a PhD education.
- you must meet the requirements for admission to the faculty's doctoral program
- excellent written and oral English skills
- documented strong background in experimental mechanics, solid mechanics and mechanics of materials
- documented excellent track record of academic achievement

The appointment is to be made in accordance with Regulations on terms of employment for positions such as postdoctoral fellow, Phd candidate, research assistant and specialist candidate and Regulations concerning the degrees of Philosophiae Doctor (PhD) and Philosodophiae Doctor (PhD) in artistic research national guidelines for appointment as PhD, post doctor and research assistant

Preferred selection criteria

- knowledge and experience in mechanical testing of materials or components
- good understanding in fatigue and fracture mechanics
- knowledge of metallography and material science would be given additional credit in evaluation
- experience in using Finite Element Codes such as ABAQUS, ANSYS, etc. for numerical analysis
- ability to conduct high quality research and publish results in acknowledged peer-reviewed conferences and journals

Personal characteristics

- motivated, independent and enthusiastic
- ability to systematically carry out goal-oriented work
- enjoy interdisciplinary research
- interest in learning and working in teams
- skills to deliver oral and written presentation of research results
- interest in conducting experimental and numerical research

Emphasis will be placed on personal and interpersonal qualities.

We offer

- exciting and stimulating tasks in a strong international academic environment
- an open and inclusive work environment with dedicated colleagues
- favourable terms in the Norwegian Public Service Pension Fund
- employee benefits

Salary and conditions

As a PhD candidate (code 1017) you are normally paid from gross NOK 532 200 per annum before tax, depending on qualifications and seniority. From the salary, 2% is deducted as a contribution to the Norwegian Public Service Pension Fund.

The period of employment is 3 years.

Appointment to a PhD position requires that you are admitted to the PhD programme in Engineering within three months of employment, and that you participate in an organized PhD programme during the employment period.

The position is subject to external funding.

It is a prerequisite you can be present at and accessible to the institution daily.

About the application

The application and supporting documentation to be used as the basis for the assessment must be in English.

Publications and other scientific work must be attached to the application. Please note that your application will be considered based solely on information submitted by the application deadline. You must therefore ensure that your application clearly demonstrates how your skills and experience fulfil the criteria specified above.

The application must include:

- CV and certificates
- transcripts and diplomas for bachelor's and master's degrees. If you have not completed the master's degree, you must submit a confirmation that the master's thesis has been submitted
- A copy of the master's thesis. If you recently have submitted your master's thesis, you can attach a draft of the thesis. Documentation of a completed master's degree must be presented before taking up the position
- name and contact information of three referees and their recommendation letters for your application for this position (Note: the referees will also be directly contacted for shortlisted candidates for the position)
- motivation letter. The motivation letter must be aligned with the subject of this call and why the candidate finds themselves suitable for this position. The candidates must include their plan of action for the first 30, 60, and 90 days of the PhD, aligned with the topic of the

project
- if you have publications or other relevant research work (the candidate’s contribution to each work must be clarified (performed tasks and percentage of contribution))
- documentation of the required criteria

If all, or parts, of your education has been taken abroad, we also ask you to attach documentation of the scope and quality of your entire education, both bachelor's and master's education, in addition to other higher education. Description of the documentation required can be found here. If you already have a statement from NOKUT, please attach this as well.

We will take joint work into account. If it is difficult to identify your efforts in the joint work, you must enclose a short description of your participation.

In the evaluation of which candidate is best qualified, emphasis will be placed on education, experience and personal and interpersonal qualities. Motivation, ambitions, and potential will also count in the assessment of the candidates.

NTNU is committed to following evaluation criteria for research quality according to The San Francisco Declaration on Research Assessment - DORA.

General information

Working at NTNU

NTNU believes that inclusion and diversity is our strength. We want to recruit people with different competencies, educational backgrounds, life experiences and perspectives to contribute to solving our social responsibilities within education and research. We will facilitate for our employees’ needs.

NTNU is working actively to increase the number of women employed in scientific positions and has a number of resources to promote equality.

The city of Trondheim is a modern European city with a rich cultural scene. Trondheim is the innovation capital of Norway with a population of 200,000. The Norwegian welfare state, including healthcare, schools, kindergartens and overall equality, is probably the best of its kind in the world. Professional subsidized day-care for children is easily available. Furthermore, Trondheim offers great opportunities for education (including international schools) and possibilities to enjoy nature, culture and family life and has low crime rates and clean air quality.

As an employee at NTNU, you must at all times adhere to the changes that the development in the subject entails and the organizational changes that are adopted.

A public list of applicants with name, age, job title and municipality of residence is prepared after the application deadline. If you want to reserve yourself from entry on the public applicant list, this must be justified. Assessment will be made in accordance with current legislation. You will be notified if the reservation is not accepted.

If you have any questions about the position, please contact Associate Professor Nima Razavi, email: nima.razavi@ntnu.no. If you have any questions about the recruitment process, please contact HR Consultant Hedda Winnberg, e-mail: Hedda.winnberg@ntnu.no.

If you think this looks interesting and in line with your qualifications, please submit your application electronically via jobbnorge.no with your CV, diplomas and certificates attached. Applications submitted elsewhere will not be considered. Upon request, you must be able to obtain certified copies of your documentation.

Application deadline: 14.04.2024

NTNU - knowledge for a better world

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The Norwegian University of Science and Technology (NTNU) creates knowledge for a better world and solutions that can change everyday life.

Department of Mechanical and Industrial Engineering

We educate graduates who can create new products, operate and maintain products, and manage projects. The Department has a variety of bachelor’s and master’s degree programmes. We conduct wide-ranging research in fields such as technology, energy, product quality and development, and productivity. The Department of Mechanical and Industrial Engineering is one of eight departments in the Faculty of Engineering.

Additional information

Place of service:

Richard Birkelands vei 2B 7034 Trondheim (Trondheim Municipality)