



NTNU

# PhD position in Performance Management of Safety-Instrumented Systems

## About the position

SFI SUBPRO

The Norwegian oil and gas industry is in the forefront with respect to subsea field developments, but new and innovative solutions are still required to meet current and future challenges. To accelerate the level of innovations within subsea production and processing, SUBPRO - a Centre for research-based innovation, was established at NTNU in 2015. The Centre is supported by the Research Council of Norway and several international industry partners. For more information about SUBPRO, please visit our website: [www.ntnu.edu/subpro](http://www.ntnu.edu/subpro).

**Unmanned facilities** represent an attractive business case for many of the current and future offshore field developments. Unmanned facilities cover subsea facilities as well as topside facilities. The unmanned topside facility may range from very simple wellhead platforms to the more complex facilities with processing equipment on-board. Subsea facilities may range from subsea well templates and pipeline distribution networks, to more complex processing facilities with subsea separation and compression.

**Safety-instrumented systems (SIS)** are vital for ensuring the safe operation. A SIS includes equipment for detection/monitoring, programmable systems for logical operations, and actuated devices that interact with the systems to be protected. Examples of SIS systems include process shutdown systems (PSD), fire and gas detection (F&G) systems (for topside facilities only), emergency shutdown (ESD) systems, overpressure protection systems (e.g. HIPPS). In an unmanned facility context, these systems may take on new roles, to replace manual tasks associated with e.g. testing, restart, and follow-up of detected faults.

The aim of this research is to ensure safe operation of unmanned facilities by aligning the design of safety-instrumented systems with the need for decision-making in operation. The starting point for the research is to characterize attributes of different unmanned facility design concepts, including operation/maintenance philosophies and facility risk picture. The next step is to utilize this insight to define requirements to the design, operation, maintenance, and condition monitoring of safety-instrumented systems. The final step is to identify, develop, and test methods and models to support decision-making needed to always maintain adequate safety level at the unmanned facility, and suggest new practices and policies for adaption by industry.

The main supervisor for the PhD project is Professor Mary Ann Lundteigen, with co-supervision from industry partner in SUBPRO.

The start-up of the position is mid 2019. The duration of the PhD position is 3-years.

## Job description

The PhD-position's general objective is to qualify the candidate for work in research positions, in industry or in academia.

The PhD position will be an integral part of the SFI SUBPRO, and it means that there will be a focus on understanding the whole picture, beyond the scope of own research focus. The research includes presenting at international conferences, in scientific journals, involving industry partners in ongoing research, and sharing results in collaboration arenas in the SUBPRO Centre.

## Qualification requirements

The qualification requirement is completion of a master's degree or second degree (equivalent to 120 credits) with a grade of B or better in terms of [NTNU's grading scale](#) in one of the following areas: Mechanical Engineering, Reliability, availability, maintainability and safety (RAMS), Engineering Cybernetics, Applied Mathematics (statistics and probability), or Systems Engineering.

Applicants with no letter grades from previous studies must have an equally good academic foundation. Applicants who are unable to meet these criteria may be considered only if they can document that they are particularly suitable candidates for education leading to a PhD degree.

The appointment is to be made in accordance with the regulations in force concerning State Employees and Civil Servants and national guidelines for appointment as PhD, post doctor and research assistant.

The applicant must also have:

- Some background in risk and/or reliability theory and analysis methods
- Excellent English oral and writing skills
- Excellent collaborative skills
- Excellent analytical skills

It is an advantage if the candidate can document Norwegian oral and writing skills and knowledge of the oil and gas industry sector and practices, in specific for safety-instrumented systems. It is also an advantage if the applicant can document previous dissemination activities (industry guidelines, scientific papers, presentations).

The motivation/cover letter must identify clearly how the candidate meets each of the qualification requirements with references to relevant parts of the CV, transcripts and other attached documents.

## Personal characteristics

In the evaluation of which candidate is best qualified, emphasis will be placed on education, experience and personal suitability, as well as motivation, in terms of the qualification requirements specified in the advertisement

## 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

PhD candidates are remunerated in code 1017, and are normally remunerated at gross from NOK 449 400 per annum before tax. 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 admission to the PhD programme in Engineering Cybernetics (<https://www.ntnu.no/studier/phtk>).

As a PhD candidate, you undertake to participate in an organized PhD programme during the employment period. A condition of appointment is that you are in fact qualified for admission to the PhD programme within three months.

Appointment takes place on the terms that apply to State employees at any time, and after the appointment you must assume that there may be changes in the area of work.

## General information

### [Working at NTNU](#)

A good work environment is characterized by diversity. We encourage qualified candidates to apply, regardless of their gender, functional capacity or cultural background. Under the Freedom of Information Act (offentleglova), information about the applicant may be made public even if the applicant has requested not to have their name entered on the list of applicants.

Questions about the position can be directed to Professor Mary Ann Lundteigen, e-mail [mary.a.lundteigen@ntnu.no](mailto:mary.a.lundteigen@ntnu.no) .

About the application:

The application must contain a motivation letter/cover letter, CV, diplomas, transcripts, certificates, and other attachments of relevance to document compliance to the qualification requirements.

Please submit your application electronically via [jobb norge.no](http://jobb norge.no). Only applications submitted via [jobb norge.no](http://jobb norge.no) are considered. Applicants invited for interview must bring certified copies of transcripts. Please refer to the application number 2019/10621 when applying.

Application deadline: 2019-05-02.

## 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 Engineering Cybernetics (ITK)

Engineering cybernetics is the study of automatic control and monitoring of dynamic systems. We develop the technologies of tomorrow through close cooperation with industry and academia, both in Norway and internationally. The Department contributes to the digitalization, automation and robotization of society. The [Department of Engineering Cybernetics](#) is one of seven departments in the [Faculty of Information Technology and Electrical Engineering](#).

Jobbnorge-ID: 168372, Søknadsfrist: Søknadsfristen er gått ut