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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.

Post Doctor position in Medium Voltage DC grid design and optimization for underwater applications (IE-149-2018)

The Faculty of Information Technology and Electrical Engineering, <http://www.ntnu.edu/ie> at the Norwegian University of Science and Technology (NTNU) has a vacancy for a 100% position (2 years) as a Post Doc researcher at the Department of Electric Power Engineering <http://www.ntnu.edu/elkraft>. The described Post Doc position is part of a research project on "High-Efficiency all-electric DC supply systems for subsea work-class remotely operated vehicles (HEROVs)". HEROVs is a joint research collaboration between NTNU and two industrial partners: Ingeteam Power Technology S.A. based in Bilbao, Spain, and Argus Remote Systems A.S. based in Bergen, Norway.

Information about the department of Electrical Power Engineering

Currently there are 12 Professors, 7 Associate Professors and 4 Lecturers at the Department of Electric Power Engineering. In addition, there are 4 Adjunct Professors, 2 Adjunct Associate Professors, 9 Postdoctoral researchers, 2 Researchers, about 35 PhD students, and 15 technical/administrative staff. Research activities are organized under two research groups: Power Systems Group and Power Technology Group. The department has a good laboratory infrastructure for research and education, as well as a mechanical workshop, supported by a technical staff of 10 persons.

The department has a wide range of teaching responsibilities, ranging from fundamental education in electric power engineering for other engineering students, Master's programs in Energy and Environment, International MSc programs within Electric Power Engineering and Wind Energy, as well as PhD education and continuing education.

Work description

The increasing growth of offshore and subsea activities in deep and ultra-deep waters, underpinned by the steep increase in offshore wind farms deployments, oil and gas processes progressively moved to the seafloor and other niche applications such as deep sea mining, military and forensics, require high number of underwater vehicles. They have high power demands and must be capable of operating under extreme conditions. The focus of the HEROVs project is on work-class Remotely Operated Vehicles (WROVs), which have power ratings exceeding 200 kVA and operate in ultra-deep waters. The WROV industry is presently transitioning to all-electric solutions enabling higher reliability, reduced weight and improved efficiency and controllability, but this poses challenging requirements to their subsea power supply system.

The goal of the overall project is to design, analyze and experimentally verify high-efficiency all-electric DC power distribution systems for deep underwater vehicles based on medium-voltage DC (MVDC) technology. In particular, within HEROVs, a post doc researcher will investigate the design and optimization of the MVDC distribution grid, while a closely related PhD project will focus on the design and optimization of power electronic converters employed on WROVs.

Within this context, there is *one vacant Post Doctor position* available at NTNU within the field of "Medium Voltage DC grid design and optimization for underwater applications".

The successful Post Doc candidate is expected to identify optimal configurations for the DC power distribution grid used to supply power to different types of submerged loads by applying multi-objective optimization techniques. This shall result in the development of a tool to identify the best configuration from multiple standpoints (e.g. in terms of losses, weight, cost, etc.) and given operating conditions. The design criteria should take into account the technical choices made for the surface generator (e.g. converter design), as well as the load mission profile. Hence, the Post Doc candidate will need to work in close synergy with a PhD candidate and other researchers contributing to the project. The final result will be the small-scale laboratory testing of the selected grid system using Power Hardware-in-the-Loop techniques, in collaboration with the industrial partner, Ingeteam.

Qualifications

Applicants must hold a PhD degree within electrical engineering and experience with MVDC application and/or a good understanding of multi-objective optimization techniques applied to electrical grids. A strong background in stability and control of power electronic systems will be merited and experience with Hardware-in-the-Loop testing will be an advantage.

Excellent analytical and communication skills are required.

The candidates must have excellent collaboration skills as well as an ability to work independently.

The Post Doc position is expected to start in autumn 2018.

Applicants currently enrolled in a PhD programme who expect to pursue the PhD degree before the date of appointment must forward documentation for the date of their final exam.

For further information about position, please contact Professor Elisabetta Tedeschi by e-mail: elisabetta.tedeschi@ntnu.no

Applicants are required to submit a one-page research proposal within the proposed research area.

Formal regulations

Appointments are made in accordance to the regulations in force regarding terms of employment for Post Doctor candidates issued by the Ministry of Education and Research, with relevant parts of the additional guidelines for appointment as a Post Doctor candidate at NTNU. The person who is appointed must comply with the conditions that apply at any time to employees in the public sector. In addition, a contract will be signed regarding the period of employment.

Language requirements

Applicants who do not master a Scandinavian language must provide evidence of good English language skills, written and spoken. The following tests can be used as such documentation: TOEFL, IELTS and Cambridge Certificate in Advanced English (CAE) or Cambridge Certificate of Proficiency in English (CPE).

Minimum scores are:

TOEFL: 600 (paper-based test), 92 (Internet-based test)

IELTS: 6.5, with no section lower than 5.5 (only Academic IELTS test accepted)

CAE/CPE: grade B or A.

Salary conditions

The Post doctor position is in code 1352 Research fellow, salary grade range from 57 in the Norwegian State salary scale, gross NOK 490.900 per year, depending on qualifications. A deduction of 2% is made as a statutory contribution to the Norwegian Public Service Pension Fund.

General

We can offer:

- an informal and friendly workplace with dedicated colleagues
- academic challenges

attractive schemes for housing loan, insurance and pension in the Norwegian Public Service Pension Fund

High motivation and good analytical and communication skills will be emphasized in the employment process.

Diversity is important to achieve a good, inclusive working environment. We encourage all qualified applicants to apply, regardless of gender, disability, and cultural background. NTNU wishes to increase the number of women in its workforce, and women are specifically encouraged to apply.

The appointment is to be made in accordance with the regulations for State Employees and Civil Servants in Norway. The candidate must adhere to regulations that concern changes and developments within the discipline and/or the organizational changes concerning activities at NTNU.

Under Section 25 of the Freedom of Information Act, information about the applicant may be made public even if the applicant has requested not to have her/his name entered on the list of applicants.

The application

Applications are to be submitted electronically through this page (<http://www.jobbnorge.no>).

The application should contain (all in one combined PDF file):

- A one-page research proposal within the proposed research area.
- CV.
- Certified copies of academic diplomas and certificates.
- Applicants from universities outside Norway are kindly requested to send a [diploma supplement](#) or a similar document, which describes in detail the study and grading system and the rights for further studies associated with the obtained degree.
- Publications relevant to the research scope and any other work which the applicant wishes to be taken into account should clearly state the applicant's contribution. A short summary should be attached outlining the applicant's input to joint work.
- A statement of purpose including an explanation of how your research interests and background would fit the position.
- List of scientific publications.
- Names and contact information of at least two references.

Incomplete applications will not be taken into consideration.

Please mark your application with: IE-149-2018

Deadline for applications: December 3, 2018.

Jobbnorge-ID: 155468, Søknadsfrist: Søknadsfristen er gått ut