AALBORG UNIVERSITY
DENMARK

PhD position in Reliable Power Electronics

Within the programme Science without Borders, Aalborg University is offering a PhD position at the Department of Energy Technology.

Project(s) Extensive research activities in achieving more reliable power electronics are going on at the Center of Reliable Power Electronics (CORPE), Aalborg University. The center is sponsored by The Danish Council for Strategic Research and hosted by Aalborg University. It also involves Aarhus University, Aachen University and ETH in Zürich and the following industrial partners: Vestas Wind Systems A/S, Grundfos A/S, Danfoss A/S and KK-Electronics A/S. The center will create a cooperative environment with a large number of Professors, Postdocs and PhD students and it will have world-class laboratory-facilities and software tools in the field of reliability and power electronics. The PhD students will have the unique possibility to develop a curriculum in an area where academia and companies will focus their interest in the next decade.

Two new PhD positions are planned on the statistical design tools for reliability analysis of power electronic systems and condition monitoring of capacitors for dc-link application in power electronic converters.

The positions are administrated by “Science without borders” and financed by stipends through CAPES. The overall theme is “Engineering and other technological areas”. Acceptance of employment is on condition of the grant from CAPES.

Condition Monitoring of Capacitors for DC-Link Application in Power Electronic Converters

Hypothesis: The degradation of capacitors can be analysed by monitoring their electrical parameters such as equivalent series resistances, capacitances and leakage currents.

Description: Capacitors for dc-link application are one of the most important components in most of the power electronic converters in terms of the reliability, physical size and cost. The reliability of the capacitors under operation is influenced by stressors like temperature, voltage and humidity. The project will develop new methods to monitor the change of the electrical parameters of electrolytic capacitors and emerging type of capacitors (film capacitors and ceramic capacitors) for dc-link application under stressed conditions. The application of the methods is twofold: condition monitoring during the accelerated lifetime testing of capacitors to achieve more accurate and useful data for degradation analysis and lifetime modelling; condition monitoring of capacitors under operation in power

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electronic converters to validate the designed in reliability and provide online degradation information for proactive maintenances.

Results: New condition monitoring methods for capacitors for dc-link application which are useful for both accelerated lifetime testing and under field operation.

The two PhD's are scheduled to run for the period 2013-2016 and the PhD students will be member of a very strong (2012 app. 80 PhD students) research environment at AAU/ET, both in power systems and power electronics. AAU/ET has a strong cooperation with industry and academia and has a large research program in the area of efficient and reliable power electronics.

Requirements

Master Degree in Electrical or Electronic Engineering or Physics with a solid background in power electronics/capacitor applications. Experience with experimental work will be an advantage. Good skills in oral and written English are also required.

Contact person: Professor Frede Blaabjerg, e-mail: fbl@et.aau.dk

To apply please see the link below:

http://www.en.tek-nat.aau.dk/vacant+positions/Science+without+Borders/