Title: Future Aircraft Electric Generators Technologies

Type of award PhD Research Studentship

Department Electrical & Electronic Engineering

Scholarship Details
If awarded the University’s Doctoral Training Programme award combined with this project sponsorship will offer the successful candidate:

• 3.5 years of full UK/EU PhD tuition fees
• a tax-free bursary of £14,777 p.a for the academic year 2018/19, and
• an industrial top-up of £4,000 p.a. (subject to contracts)
• internship
• a PhD that will be affiliated to the UK Centre for Power Electronics, facilitating exchange of ideas with the wider PhD and academic community.

Duration 3.5 years

Eligibility UK/EU applicants only who have been resident in the UK for 3 years prior to 1 September 2018

Start Date As soon as possible

PhD Topic Background/Description
This PhD will develop new modelling / predictive algorithms to quantify the life expectancy of high speed rotating machines operating in a harsh environment. New “smart” technology will be developed to integrate these algorithms into the design of high-speed machines. The idea will be to investigate which parameters that can be readily monitored from the static part of the machine can be linked to parameters on the rotating part of the machine. The successful candidate will develop the models from finite element analysis backed up by validation through experimental testing and where necessary new ways of making the measurements will need to be defined.

These activities are part of a wider industry funded research programme focusing on the concept of more electric aircraft and as such the work will be supporting the reduction of weight and volume of the machine whilst improving the in-service reliability. Being able to reliably predict the point of failure sufficiently far in advance for action to be taken at the scheduled maintenance point, thus eliminating a costly unscheduled maintenance operation is the intent of this project.

PhD Specific Aims/Objectives
The first part of the PhD will develop the models of the high-speed rotating machine in a way that is capable of highlighting the machine’s deterioration with operating time.

The work will then go on to develop new, and refine the existing, ways of measuring the various operating parameters, voltage, current and temperature for example, of the high-speed machine during operation.
Finally, specific methods of collating and analysing the data recorded during the operation of the machine to compare with the models and give prediction of its life expectancy will be developed.

URL for further information: (http://www.bris.ac.uk/engineering/research/em/phd-opportunities-)

**Candidate Requirements**

The *essential requirement* is a good undergraduate degree (1st, 2:1 or equivalent) in any of the following: *mechanical, electrical, aerospace, electro-mechanical, or mechatronics engineering* (or a closely related subject).

Experience of any/all of the following areas would be advantageous to the successful candidate:

- Analysis of electro-mechanical systems
- Understanding of heat transfer concepts
- Modelling of dynamic systems
- Using sensors, instrumentation and data capture systems

**Informal enquiries**

Please contact Dr Drury, d.drury@bristol.ac.uk or phone 0117 9545390

For general enquiries, please email seem-pgr-admissions@bristol.ac.uk

**Application Details**

To apply for this studentship submit a PhD application using our online application system [www.bristol.ac.uk/pg-howtoapply]

Please ensure that in the Funding section you tick “I would like to be considered for a funding award from the Electrical & Electronic Engineering Department” and specify the title of the scholarship in the “other” box below with the name of the supervisor Dr Drury.

Closing date for applications: **1 March 2019**

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