



Plenary Title: All Electric Flight - technology requirements, progress to date and future prospects

Prof Pat Wheeler, Head of Department of Electrical and Electronic Engineering, Professor of Power Electronic Systems



Abstract. There has recently been a major change in the design of aircraft. Electrical systems are being used in applications, which have traditionally been powered by hydraulic or pneumatic sources. The Boeing 787 and the Airbus A380 both have significantly larger electrical systems than any previous aircraft and this has led to a wealth of technology developments. Electrical systems are now being used for aircraft actuation systems, wing ice protection, environmental control systems and fuel pumping. These new systems are helping to make future aircraft more fuel efficient and quieter, improving the environment for everyone. However, this is just the start of the changes to aircraft design. A roadmap leading to a fully electric aircraft for civil applications is now emerging. The technology challenges involved for power electronics, electrical systems, control and electrical machines are being defined and these requirements give a view of the fantastic opportunities for research teams to make a real impact. The issues to be resolved include equipment weight, volume, cost and reliability. This presentation will describe these exciting, future challenges for the Electrical Engineering community.

2. Brief Biography

Prof Pat Wheeler received his BEng [Hons] degree in 1990 from the University of Bristol, UK. He received his PhD degree in Electrical Engineering for his work on Matrix Converters from the University of Bristol, UK in 1994. In 1993 he moved to the University of Nottingham and worked as a research assistant in the Department of Electrical and Electronic Engineering. In 1996 he became a Lecturer in the Power Electronics, Machines and Control Group at the University of Nottingham, UK. Since January 2008 he has been a Full Professor in the same research group. He is currently Head of the Department of Electrical and Electronic Engineering at the University of Nottingham. He is an IEEE PELs 'Member at Large' and an IEEE PELs Distinguished Lecturer. He has published 400 academic publications in leading international conferences and journals.

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