

Dr. Hiro Akagi will give a presentation about

MEDIUM-VOLTAGE POWER CONVERSION SYSTEMS IN THE NEXT GENERATION

Date: February 2, 2007
Time: 14h00
Place: Delft University of Technology, EWI Faculty
Zaal D, Mekelweg 4, 2628 CD Delft

If you wish to attend this event, please send an email with your name and address to B.I.H.Martens@tudelft.nl so we can estimate how many people will attend this event

The abstract:

This talk focuses on the next-generation medium-voltage power conversion systems based on transformerless cascade PWM converters and bi-directional isolated dc/dc converters. As a core circuit of the medium-voltage power conversion systems. A 350-V, 10-kW and 20-kHz dc/dc converter is designed, constructed and tested to verify the viability and effectiveness. The dc/dc converter consists of two single-phase full-bridge converters using eight IGBTs and a 20-kHz transformer with a nano-crystalline soft-magnetic material core and litz wires. The transformer plays an essential role in achieving galvanic isolation between the two full-bridge converters. The overall efficiency from the dc-input to dc-output terminals is accurately measured to be as high as 97%. Loss analysis clarifies that the overall efficiency may reach 99% or higher when SiC-based power devices are used. In addition, this talk addresses the 6.6-kV transformerless STATCOM(STATIC synchronous COMPensator) intended for achieving reactive-power control in industrial and distribution power systems. It is characterized by direct connection to the 6.6-kV grids, thus bringing significant reductions in cost, weight and size to the 6.6-kV STATCOM.

Hirofumi Akagi (M'87-SM'94-F'96) was born in Okayama, Japan, in 1951. He received the B.S. degree from Nagoya Institute of Technology, Nagoya, Japan, in 1974, and the M.S. and Ph.D. degrees from Tokyo Institute of Technology, Tokyo, Japan, in 1976 and 1979, respectively, all in electrical engineering. In 1979, he joined the Department of Electrical Engineering, Nagaoka University of Technology, Nagaoka, Japan, as an Assistant Professor, and later he became an Associate Professor. In 1987, he was a Visiting Scientist at Massachusetts Institute of Technology (MIT), Cambridge, for ten months. From 1991 to 1999, he was a Professor in the Department of Electrical Engineering, Okayama University, Okayama, Japan. From March to August of 1996, he was a Visiting Professor at University of Wisconsin, Madison, and then at MIT. Since January 2000, he has been a Professor in the Department of Electrical and Electronic Engineering, Tokyo Institute of Technology, Tokyo, Japan.

His research interests include power conversion systems, adjustable-speed motor drive systems and the relevant EMI filters, high-frequency resonant-inverters for induction heating and corona discharge treatment processes, active filters for power conditioning, self-commutated BTB systems, and FACTS devices.

Dr. Akagi has received the IEEE Transactions on Industry Applications First Prize Paper Award for 1991, and the two IEEE Transactions on Power Electronics First Prize Paper Awards for 1998 and 2002, along with nine IEEE IAS Committee Prize Paper Awards. He was a recipient of the IEEE William E. Newell Power Electronics Award in 2001. He was elected as a Distinguished Lecturer of the IEEE Industry Applications and IEEE Power Electronics Societies for 1998-1999. Since 2003, he has been Chair of the IEEE Industry Applications Society Japan Chapter. Currently he is president of the IEEE Power Electronics Society.