IEEE IAS/PELS/IES German Chapter Meeting at Wuppertal University

By: Ingo Hahn

The first meeting of the IEEE IAS/PELS/IES German Chapter in 2005 was organised by the Electrical Machines and Drives Laboratory at Wuppertal University (Prof. Dr.-Ing. Ralph Kenneb) and started in the afternoon of April 7th at the railway station of Solingen, which is located close to Wuppertal. From there the chapter members were transferred to the workshop of the "Solinger Stadtwerke" (public transport company of Solingen) by a special transport system - the O-Bus (trolley bus). This bus uses dc voltage of 600 V and is one of only two trolley bus systems in Germany. The O-bus transports nearly 50% of all passengers within Solingen city - 60 000 daily. The chapter members had the opportunity to watch the modern drive technology of the O-Bus. Two engineers from the company Kiepe Elektrik answered all questions concerning technical details of the used power electronics components within the trolley buses.

One of the newest trolley buses transported the visitors to the next highlight - the unique and world-famous Schwebebahn (suspension railway) of Wuppertal. This system is more than 100 years old - the trains are hanging “the wrong way around” under rails, which are built mostly above the river Wupper or over the streets of Wuppertal. The workshop of the Schwebebahn was visited. Within the workshop all replacement parts are produced, because the Schwebebahn is unique in the world. Afterwards the visitors took a ride on the “Kaiserwagen” (emperor's coach), a train used by the German emperor Wilhelm II. and his wife 100 years ago. The “Schwebebahn” is supplied by an aluminium rail with a voltage of 600 V and operates on a track with 13.3 km length. Each train needs 30 minutes to cover the distance. The maximum speed is 60 km/h.

After returning to the workshop of the “Schwebebahn” the members of the chapter had the opportunity to watch a movie about this special transport system, which carries around 70 000 people each day and is still the safest public transport system worldwide.

The day closed with a nice dinner in the guest house of the Wuppertal University.

The second day the faculty of electrical engineering, information and media technology was presented by Prof. Bernd Tibken, who is Dean of the faculty and also head of the institute of automatic control. He started with an overview about the history of the Wuppertal University. The historical roots can be dated back to the year 1880, where the university starts as a school of engineering. One topic was the implementation of bachelors and masters degrees at german universities, while leaving the “Dipl.-Ing.” degree in the future. This topic was also later discussed, based on more informations about the Bologna process, its implications and the initiative started by the nine leading technical universities in Germany presented by Prof. Helmut Späth, University Karlsruhe.

Furthermore Prof. Bernd Tibken presented the institute of automatic control. Actual research activities are in the field of arithmetic interval theory, image processing in the loop, intelligent control systems and Lyapunov based control of dynamical systems.

Next Prof. Joachim Holtz, emeritus of the institute of electrical machines and drives, presented some topics about the investigations done in the field of sensorless speed and position control of electrical machines, namely the asynchronous machine and the permanent magnet synchronous machine.

In the sequel Prof. Detlef Krahé, head of the institute of digital signal processing and electroacoustics, gave an overview about the research activities and the results in the field of active noise control and its applications. With some physical experiments he demonstrated the effectiveness of the found methods to actively control the noise generated by a smokestack very impressively.

The last lecture was given by Dr. Wolfgang Fischer, chair for power electronics, Magdeburg University, about his investigations in using simulation tools e.g. PSIM, ICAP/4, SIMPLORER or SABER in teaching power electronics. He emphasized the necessity to use modern technique in the curricula of the students.

The lectures were followed by the chapter awards ceremony: Mrs. Aurélie Bocquel, Member, received the best paper award for her contribution “300 MW Variable Speed Drives for Pump Storage Plant Application Goldisthal” together with Hans-Peter Lips, Fellow, for his contribution “High-Power Direct-Light-Triggered Thyristor Valve Technology - the Basis for Advanced Power Electronic Solutions in Transmission Systems”. Dr. Olaf Simon was awarded for the best presentation of the company “SEW Eurodrive” during a chapter meeting in 2004. Last but not least Prof. Werner Leonhard, Life Fellow, received the Chapter Award with an induction motor trophy for his scientific contributions about “Nachhaltige Energieversorgung aus regenerativen Quellen”, i. e. sustainable energy supply using...
regenerative sources, and his continuous support of the chapter.

After lunch the participants got very interesting informations and impressive physical demonstrations about sensorless position control of a PM synchronous machine, optimized pulse pattern generation to control an asynchronous machine at stator frequencies below 300 Hz, active noise control, control of inverted pendulum and robotics during a laboratory tour.

For further information about the IEEE IAS/PELS/IES German Chapter please visit our homepage at http://www.ewh.ieee.org/r8/germany/ias-pels.

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"Hans-Peter Lips, Fellow, receives the Best Paper Award 2004. From left to right: Prof. Axel Mertens (University Hannover), Hans-Peter Lips (Siemens AG, Power Transmission and Distribution), Prof. Helmut Spaeth (University Karlsruhe), Dr. Peter Magyar (IEEE IAS Region 8 Chapters Area /West/ Chair)"

"Prof. Werner Leonhard, Life Fellow, receives the Chapter Award 2005 with an induction motor trophy. From left to right: Prof. Axel Mertens (University Hannover), Prof. Werner Leonhard (Technical University Braunschweig), Prof. Helmut Spaeth (University Karlsruhe), Dr. Peter Magyar (IEEE IAS Region 8 Chapters Area /West/ Chair)"

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