

International Power Engineering Research Collaborations

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Abstract — This is a summary of the presentations of the panel entitled “International Power Engineering Research Collaborations” at the 2006 IEEE/PES GM in Montreal, Quebec, Canada. The panel chair George Gross and the seven panelists from different parts of the world aim to summarize the key aspects of research collaborations in various power engineering domains and across virtually all the continents. The collaborative efforts range from market mechanisms to renewable energy integration and from specific power topics to interdisciplinary projects.

Index Terms — Collaborative Research and Education, Renewable Energy, Market Mechanisms, Power Systems, International Cooperation, Power Engineering Education, Industry and Government Support

PANEL PRESENTATIONS SUMMARY

ELECTRICITY is a critically important infrastructural industry. The importance of electricity is on the rise as efficient and environmentally sensitive electricity services are key requirements for each nation’s global competitiveness. The initial presentation by the panel chair, George Gross, focuses on an overview of the changing nature of research collaborations in the power engineering field. The myriad changes in the power industry throughout the world and the globalization of industry have major impacts on the topics of research projects and the education of the new generation of power engineers. The nature of multi disciplinary research collaborations and the impacts of research on policy formulation are also discussed.

This panel will discuss a large array of different research collaborations ranging from small to large in scope of activities and funding levels. The presentation of Francisco Galiana focuses on the collaborative ventures of the Electric Power Laboratory of McGill University with foreign institutions in Spain, Brazil, China and Malaysia. The presentation discusses the objectives of such projects and the necessary although not necessarily suf-

ficient conditions that make such collaborations a success from the prospective of the parties involved. The nature of the projects and funding sources are also described.

The presentation by Nouredine Hadjsaid focuses on a framework of international collaboration at the National Polytechnic Institute of Grenoble in the area of power engineering with various entities around the world. An excellent example of these collaborative efforts is the international CRIS Institute for Critical Infrastructure, a research and dissemination organization with research centers, universities and industries in North America, Europe and Asia. These entities are collaborating in the area of critical infrastructures. In more specific areas of power engineering, the Power Laboratory of Grenoble (LEG) is very active in joint research projects, co-advising of PhD students and exchange of permanent research staff with certain US, Chinese and European universities. The discussion includes various aspects of the required framework of such collaborations and past experiences. An important part of the presentation is the common vision required for fostering academic collaborations and for developing the required funding.

The presentation of Nikos Hatziargyriou describes some research activities in Europe on the integration of distributed energy resources (DER) in the electricity networks of the future. The Framework Programmes (FP) for Research is the main European Union (EU) funding mechanism for research, technological development and demonstration. With a budget of almost one billion Euros, projects in the area of energy from the previous FP5 (1998-2002) are well advanced, with many entering the critical phase of implementing and disseminating their results. The total expenditure exceeding €130 million on European RTD projects for the large-scale integration of renewable energy sources and distributed generation laid the foundation work in the DER field. The main objective of FP6, which runs from 2002 to 2006, is to contribute to the creation of a true European Research Area. One of the thematic priorities of FP6 is large-scale integration of DER into electricity networks and a second is sustain-

able energy systems. This presentation gives a brief overview of DER related projects supported under the EU FP5 and FP6 and presents a summary of main results and further activities planned for the next years. It also presents the current discussions for FP7-Smart Energy Networks, which is currently being planned.

The presentation of Hugh Outhred is on the many collaborative efforts of the University of New South Wales (UNSW), an institution that has been actively involved in international research collaboration in the field of electric power engineering for many years. The nature of those collaborations are reviewed with the focus on current activities, which are both formal and informal and involve Australia, Asia, North America and Europe. In particular, the research in electricity industry restructuring, which is approached in an interdisciplinary fashion both within UNSW and with respect to collaborators is discussed. UNSW is in the process of establishing a campus in Singapore and the expectation is for research collaboration with Asian countries to grow as a consequence.

The presentation of Goran Strbac focuses on some of the collaborations in the power systems area that involve English universities. The scope of the collaborative efforts are broad and some of the projects in the renewable resources area are discussed

The collaborations described in the presentation of Nikolai Voropai focus on efforts aimed at the development of East Russia's power sector. East Siberia and the Far East of Russia are very important regions from the perspective of energy resources. There are many oil, gas and coal fields, hydro resources. Russia is developing energy cooperation with neighboring countries (China, Japan, Korea) with a view to expand the economy of Eastern Russia and to undertake economical and political partnership with Asia-Pacific countries. There is strong rationale for the strengthening of international cooperation of the power sectors of these countries to take advantage of load and resource diversity. Several bilateral feasibility studies for possible cooperation on power were carried out. The training of future researchers for joint work in the areas of international power cooperation is a key aspect. This educational aspect and the nature of the collaborative studies in the past and ongoing are described.

The presentation of Felix Wu discusses research collaboration in Asia and presents the view from Hong Kong, is the world city in Asia. Researchers in power engineering in Hong Kong are actively promoting and engaging in research collaborations in various activities

in Asia and worldwide. In this presentation, the focus is on some important aspects of research collaboration in Asia in which Hong Kong plays a role. These aspects include the organization of regional conferences, the student exchanges underway, the development of short courses, seminars and exchange visits, the joint supervision of graduate students and various joint research projects. The experiences on these aspects are discussed.

This panel represents a first attempt for IEEE Power Engineering Society to shed light on the experiences to date on research collaborations. In light of the globalization underway, such experiences are very important.

BIOGRAPHIES

Francisco Galiana is a Professor of Electrical Engineering at McGill University in Montreal, Canada.

George Gross is a Professor of Electrical and Computer Engineering and Professor, Institute of Government and Public Affairs at the University of Illinois at Urbana-Champaign.

Nouredine Hadjsaid is the Director of the Laboratoire d'Electrotechnique de Grenoble at the National Polytechnic Institute of Grenoble in France.

Nikos Hatziargyriou is a Professor of Electrical and Computer Engineering at the University of Athens in Greece.

Hugh Outhred is the Presiding Director of the Centre for Energy and Environmental Markets and a Professor of Electrical Engineering and Computer Science at the University of New South Wales in Australia.

Goran Strbac is a Professor of Electrical and Computer Engineering at Imperial College in London.

Nikolai Voropai is the Director of the Siberian Energy Institute in Irkutsk, Russia.

Felix Wu is a Professor of Electrical and Electronic Engineering at the University of Hong Kong.