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PANEL SESSION INTRODUCTION

IEEE POWER ENGINEERING SOCIETY
ENERGY DEVELOPMENT AND POWER GENERATION COMMITTEE

PANEL SESSION: RELIABILITY COORDINATION IN A MARKET ENVIRONMENT – ASIAN AND AUSTRALIAN EXPERIENCE

(Nikolai Voropai and Tom Hammons)

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Sponsored by: International Practices for Energy Development and Power Generation[#]

Chairs: Nikolai Voropai, Energy Systems Institute, Irkutsk, Russia
Tom Hammons, University of Glasgow, UK

INTRODUCTION

On behalf of the Energy Development and Power Generation Committee, welcome to this Panel Session on RELIABILITY COORDINATION IN A MARKET ENVIRONMENT – ASIAN AND AUSTRALIAN EXPERIENCE.

The experience of power industry restructuring in many countries of the world has highlighted the reliability-related difficulties and problems that have been encountered. Transition to a competitive model of power industry organization has called for thorough and comprehensive studies. As a result of restructuring there is money and the subjects of relations with non-coincident criteria. The necessity of rational combination of market mechanisms of management and state regulation that should be indirect has been revealed. It has turned out that competition mechanisms, though, enhance commercial efficiency of electric power system operation but may have an adverse impact on reliability of the electric power system and power supply to consumers.

Therefore, it is important to analyze and to compare the experience of different countries considering:

- Specific features of economic interrelations between different subjects of relations – generation and network companies, power supply organizations and consumers;
- Principles of providing reliability of Electrical Power Systems and power supply;
- Economic mechanisms of coordinating the interests of different subjects of relations.

This is discussed in the Panel Session by international authorities in Asia.

The Panelists and Titles of their Presentations are:

[#] Document prepared and edited by T J Hammons

1. Jin Zhong, University of Hong Kong and Kong Chongqing Kang, Tsinghua University, China. Transition of China Power Industry: Market Efficiency and Reliability Issues (Paper 07GM1052)
2. Subrata Mukhopadhyay and Sushil K Soonee, Reliability: from Load Forecasting to System Operation in Indian Power System (Paper 07GM0866).
3. Nikolai I.Voropai, Energy Systems Institute, Irkutsk, Russia. Reliability Coordination in Power Supply Problem (Paper 07GM0309)
4. Pradit Fuangfoo, Provincial Electricity Authority, Bangkok, Thailand; Wei-Jen Lee, Energy Systems Research Center, University of Texas at Arlington, TX, USA and Khaled A. Nigim, University of Waterloo, Canada. Intentional Islanding Operation to Improve the Service Reliability of Thailand Electric Power System (Paper 07GM0313).
5. Asaf M. Gousseinov and Bagir S. Akhundov, Azerbaijan Research and Design Institute of Power Engineering, Baku, Azerbaijan. Impact of Distributed Generation on Stability of the Azerbaijan Power Supply System in Market Conditions (Paper 07GM0519).
6. R.C. Bansal, School of Engineering and Physics, University of the South Pacific, Fiji; and T. J. Hammons, Glasgow University, UK. A Discussion on the Restructuring of the Indian Power Sector (Paper 07GM0197)
7. Jaeyoung YOON, Dongwook Park and Hoyong Kim, Korea Electrotechnology Research Institute; and Jae-seok Choi, Gyeongsang, National University Jinju, ROK, Korea. Possible Interconnection Scenarios and Impacts on Composite System Reliability between "ROK-DPRK-RF" (Paper 07GM0938).
8. Sang Seung Lee, Yu Chang Kim, Joong Kyo Han, Jong Keun Park, Seung Hun Lee, Masaharu Osawa, Seung Il Moon, and Yong Tae Yoon, Korea. Northeast Asia Power Interconnection Studies Trends and Prospects in Korea (Paper 07GM0884)

Each Panelist will speak for approximately 20 minutes. Each presentation will be discussed immediately following the respective presentation. There will be a further opportunity for discussion of the presentations following the final presentation.

The Panel Session has been organized by Tom Hammons (Chair of International Practices for Energy Development and Power Generation, University of Glasgow, UK) and Nikolai Voropai (Director, Energy Systems Institute, Irkutsk, Russia).

Tom Hammons will moderate the Panel Session.

PRESENTATIONS

The first presentation is on Transition of the China Power Industry and discusses Market Efficiency and Reliability Issues. Jin Zhong, University of Hong Kong and Kong Chongqing Kang, Tsinghua University, China has prepared it. Jin Zhong will present it.

With deregulation of the power industry, power system reliability becomes a critical problem. The impact of deregulation on system reliability is one of the concerns after unbundling of the traditional integrated power companies. In this presentation, the reliability in restructuring the power industry in China is introduced. Some reliability data is provided. The data shows that the reliability level has increased significantly in the past two decades. More and more measures are being applied to guarantee reliable operation in the restructured power systems. Reliability issues and challenges of the Chinese power industry are discussed.

Jin Zhong received her BSc. (Eng.) degree from Tsinghua University, China, in 1995, the MSc. (Eng.) degree from the Electric Power Research Institute, Beijing, in 1998, and her PhD degree from Chalmers University of Technology, Gothenburg, Sweden, in 2003. She is currently an Assistant Professor in the Department of Electrical and Electronic Engineering at the University of Hong Kong.

Chongqing Kang received his PhD. degree from the Electrical Engineering Department of Tsinghua University, China, in 1997. He is now a Professor at the University. His research interests include electricity market, power system planning and reliability.

The second presentation has been prepared by Subrata Mukhopadhyay and Sushil K Soonee. It discussers Reliability from Load Forecasting to System Operation in the Indian Power System. Subrata Mukhopadhyay will present it.

It is shown how effectively markets could take care of reliability with self-healing mechanisms, particularly in a country like India that has power shortages. At the same time important parameters like grid voltage too is considered, although a lot more is expected in the time to come. Though immediately not tagged with pricing in the power market directly, grid security, restoration, mock trial for black start, etc. from reliability angle are other pertinent aspects that will be touched on. As such, reliability coordination in every aspect is playing an important role from load forecasting to system operation under the changing scenario with development of power market in India.

Subrata Mukhopadhyay's employment experience of 35 years includes teaching and research in Roorkee and power system planning, design and operation with the Central Electricity Authority of Government of India. He has authored two books and twenty-eight papers, was awarded the IEEE Third Millennium Medal in 2000, the PES Delhi Chapter Outstanding Engineer Award & PES Asia-Pacific Regional Outstanding Engineer Award for 2001, RAB Leadership & Achievement Awards in 2002 and 2004, respectively. He is also a Fellow of the Institution of Engineers (India) and the Institution of Electronics and Telecommunication Engineers, India.

Sushil K Soonee currently heads the Northern Regional Load Dispatching Center of the Power Grid Corporation of India as Executive Director. After a brief stint in the private sector he joined the Central Electricity Authority and worked extensively in integration of the State Grid to form a Regional Grid in the Eastern and North-Eastern Region, carried out Research and Literature Survey in Power System Operation and Control at IIT Kharagpur in 1981, traveled extensively in Europe, USA and SAARC countries. He has authored 24 technical articles presented in various forums, chaired many technical sessions in seminars / workshops, and acted as Member of various committees for Regional Power System on disturbance and restoration. He is a Fellow of the Institution of Engineers (India).

The next presentation has been prepared by Nikolai I. Voropai, Director, Energy Systems Institute, Russian Academy of Sciences, Irkutsk, Russia. It is entitled Reliability Coordination in Power Supply Problems. Tom Hammons will present it.

The presentation addresses the problems of power supply reliability in a market environment. The specific features of economic interrelations between power supply organization and consumers in terms of reliability assurance will be discussed. The principles of providing power supply reliability are examined. The economic mechanisms of coordinating the interests of power supply organization and consumers to provide power supply reliability will be suggested.

Nikolai I. Voropai was born in Belarus in 1943. He graduated from the Leningrad (St. Petersburg) Polytechnic Institute in 1966. Voropai received his PhD degree from the

Leningrad Polytechnic Institute in 1974 and the Doctor of Technical Sciences degree from the Siberian Energy Institute in 1990.

His research interests include: modeling of power systems, operation and dynamics performance of large power grids; development of national, international and intercontinental power grids; reliability and security of energy systems.

The fourth presentation discusses Intentional Islanding Operation to Improve the Service Reliability of the Thailand Electric Power System. Pradit Fuangfoo, Provincial Electricity Authority, Bangkok, Thailand; Wei-Jen Lee, Energy Systems Research Center, University of Texas at Arlington, TX, USA and Khaled A. Nigim, University of Waterloo, Canada have prepared it. Wei-Jen Lee will present it.

This presentation discusses both quasi-steady state and dynamic studies of a sample sub-transmission system to explore possible arrangements and operation strategies to allow DGs to be continue operated under islanding conditions.

Wei-Jen Lee received his B.S. and M.S. degrees in Electrical Engineering from National Taiwan University, Taipei, Taiwan, in 1978 and 1980, respectively, and a Ph.D. degree in Electrical Engineering from the University of Texas at Arlington in 1985. Since then, he has been with the University of Texas at Arlington and currently is a Professor of the Electrical Engineering Department.

Khaled Nigim has a Ph.D. in Electrical Engineering from the University of Leicester, England, UK and B.Sc. in Electrical Engineering from Zagazig University of Cairo, Egypt. He is the Coordinator of the on-line Master of Engineering in Electric Power 'MEng and GDip graduate program' at the Department of Electrical & Computer Engineering, University of Waterloo, Canada.

The fifth presentation is prepared by Asaf M. Gousseinov and Bagir S. Akhundov, Azerbaijan Research and Design Institute of Power Engineering, Baku, Azerbaijan. It is entitled: Impact of Distributed Generation on Stability of the Azerbaijan Power Supply System in Market Conditions. Tom Hammons will present it.

The development of the fuel and gas industry, its movement towards the international market arena and gradual change of economy sectors towards market conditions contribute to dynamic improvement and development of economy of the Republic of Azerbaijan. Under present conditions the demand for electricity outstrips power supply. At least 5 regions of the republic have consumers located far away from the central power supply system, and they already express their interest in independent power sources due to interruptions in the power supply and its low quality. At the present moment, consideration is being given to the Distributed Generation principle. This will be discussed in the presentation.

Asaf Gouseynov was born in Baku (Azerbaijan) in 1937. He graduated from the Azerbaijan Industrial Institute (currently Azerbaijan State Oil Academy). At the present moment he is employed by the Azerbaijan Power Engineering institute of Design and research as Deputy Director.

Baghir Akhundov was born in Baku (Azerbaijan) in March-1977. He graduated from the Azerbaijan State oil Academy in 1999 with Master's Degree (honors) in Electrical

Engineering. He proceeded with research work in the area of power system optimization and stability and is currently concentrating his efforts on studying impact of introducing Distributed Generation principles in the Azerbaijan power supply system.

The sixth presentation is by R.C. Bansal, School of Engineering and Physics, University of the South Pacific, Fiji; and T. J. Hammons, Glasgow University, UK. and is entitled: A Discussion on the Restructuring of the Indian Power Sector. T J Hammons will present it.

During the past few years the Indian power sector has experienced major. This presentation discusses the restructuring/privatization of the Indian power sector and addresses how it affects the reliability of power system. Key issues related with the performance of the power sector like privatization of power sector, renovation and modernization (R&M) of old plants, metering problems, increase of hydropower and non-conventional energy sources to overcome pollution problems are discussed. Advantages of information technology and major areas in which it can be used will also be discussed.

R.C. Bansal received the M.E. degree from Delhi College of Engineering, Delhi, India, in 1996; MBA degree from Indira Gandhi National Open University, New Delhi, India, in 1997; and the Ph. D. degree from Indian Institute of Technology ((IIT), Delhi, India in 2003. Currently, he is with the faculty of Electrical and Electronics Engineering, School of Engineering and Physics and Head of the Renewable Energy Group, in The University of the South Pacific, Suva, Fiji.

Thomas James Hammons (Fellow IEEE 1996) received the degree of ACGI from City and Guilds College, London, U.K. and the B.Sc. degree in Engineering (1st Class Honours), and the DIC, and Ph.D. degrees from Imperial College, London University. He is a member of the teaching faculty of the Faculty of Engineering, University of Glasgow, Scotland, U.K.

The seventh presentation is entitled Possible Interconnection Scenarios and Impacts on Composite System Reliability between "ROK-DPRK-RF. Jaeyoung YOON, Dongwook Park and Hoyong Kim, Korea Electrotechnology Research Institute; and Jae-seok Choi, Gyeongsang, National University Jinju, ROK, KOREA has prepared it. Jaeyoung YOON will present it.

It presents possible interconnection scenarios and reliability analysis results on power exchange between “ROK-DPRK-RF”. Here, four possible scenarios on power system interconnection between “ROK-DPRK-RF” are proposed to compare pre-feasibility study results in technical, economic and marketable viewpoints. The presentation deals with the composite system reliability on interconnected power system.

Yoon Jae-Young is the head of the Power System Research Group at the Korea Electrotechnology Research Institute [KERI]. He received his BSc., MSc. and Ph.D degrees in electrical engineering from Busan National University. Since 1987, he has been working in the research field of power system analysis, including custom power systems. Currently, he is managing a research project examining the applications of HTS-equipment, such as cables, current-limiting reactors and transformers. Additionally, he plays a key role in the research project related to the Northeast Asia Power System Interconnection, including North Korea. jyyoon@keri.re.kr

Kim, Ho-yong is the director of Power System Research Lab. at Korea Electrotechnology Research Institute [KERI]. He has been working at KERI since 1986. He received BS degree from Seoul National University, Korea in 1979 and MS, Ph.D. from University of Texas at Austin ,USA in 1982 and 1985 respectively. His main research areas are distribution automation and AI applications to power systems and Power System Interconnection.

Park, Dong-wook is vice president of R&D and Testing at the Korea Electrotechnology Research Institute [KERI]. He received a BSc in Electrical Engineering from Seoul National University in 1978, MSc. from Busan National University, and Ph.D from University of Manchester Institute of Science and Technology [UMIST] in England. He has been with KERI since 1978..

Choi, Jae-seok was born at Kyeongju, Korea on 1958 and obtained B. Sc, M. Sc and Ph. D degrees from Korea University in 1981, 1984 and 1990 respectively. His research interest includes Fuzzy Applications, Probabilistic Production Cost Simulation, Reliability Evaluation and Outage Cost Assessment of Power System. He has been a Post-Doctor at University of Saskatchewan in Canada on 1996. Since 1991, he has been a faculty of Gyeongsang National where is now a professor.

The final presentation is by Sang Seung Lee, Yu Chang Kim, Joong Kyo Han, Jong Keun Park, Seung Hun Lee, Masaharu Osawa, Seung Il Moon, and Yong Tae Yoon, Korea. It is entitled: Northeast Asia Power Interconnection Studies Trends and Prospects in Korea. Yong Tae Yoon will present it.