

## **IEEE Region 10 Technical Conference on Computers, Communications, Control and Power Engineering (IEEE TENCON'02)**

The conference will be held in Beijing, China on October 28-31, 2002

Schedule: Submission of Papers:	March 15, 2002
Notification of Acceptance:	May 15, 2002
Submission of Camera-ready Papers:	June 30, 2002
The Conference	October 28-31, 2002

Sponsored by IEEE Region 10, Organized by IEEE Beijing Section

Conference Chair: Prof. Zong Sha, China, Co-chair: Prof. Jung U. Seo, Korea

Contact: <http://TENCON02.njtu.edu.cn/>

## **The 11th Asian Conference on Electrical Discharge (ACED-2002)**

The Conference will be held at Soongsil University, Seoul, Korea and be chaired by Prof. Hoo-Re. Kwak. The details are now worked out.

If you have any question on this conference, please contact with Dr. N. Hayashi, Secretary of ACED Int'l Steering Committee, by the e-mail to [hayashi@asem.kyushu-u.ac.jp](mailto:hayashi@asem.kyushu-u.ac.jp).

Noriyuki HAYASHI (Kyushu University, Japan; Secretary of ACED Int'l Steering Committee)

## **The 2nd International Discussion Conference on Nano Interface Controlled Electronic Devices**

The conference will be held in Japan. The details are now worked out.

## **7th IEEE International Conference on Properties and Applications of Dielectric Materials (ICPADM 2003)**

ICPADM-2003 will be held in Nagoya, Japan, in June 2-5, 2003. This conference is sponsored by the IEEE Dielectrics and Electrical Insulation Society (DEIS) and it will be cosponsored by the IEE Japan.

The details will be in the Call for Papers which will be distributed later.

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# Introduction of Research Activities on High Voltage Engineering and Insulation in Indonesia

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Indonesia is situated around the equator where the sun is overhead in the sky throughout the year. This condition leads to the so-called tropical climate where the seasonal migration of the sun and its movements dominate the climate in Indonesia. The climate affects the insulation system in Indonesian electric power network.

## Research activities

Research activities in Indonesia are driven by the needs to provide a reliable electricity supply. So far, research activities that relate with the application of high voltage industries are not significant. The research activities described briefly here – under are:

### a. Lightning research.

Since the lightning frequency in Indonesia is high and the electric system often fails due to lightning, the investigation of lightning is important. There are two group of lightning research. Firstly, rocket triggered lightning research group which was concluded several years ago. Secondly, natural lightning research group using the TDD (time different and distance) and TOA (time of arrival) systems. Both systems are operated by Bandung Institute of Technology. By using the two systems, some of lightning parameters such as lightning flash density, current amplitude and stepness can be estimated. The lightning performances of high voltage transmission lines were also investigated.

### b. Investigation on polymeric insulating materials

Tropical effects on the polymeric insulations such as cycloaliphatic Epoxy (CEP) and Elastomer Silicone Rubber are being investigated. The investigation carried out on the above mentioned materials is emphasized mainly on their performance under tropical conditions, which as previously stated are characterized by high humidity, high solar radiation level and the

number of lightning strokes occurrence. The experiment consists of accelerated aging and natural aging tests under tropical conditions. Bulk as well as surface properties of the materials were observed and some parameters were measured and discussed. The parameters concerned are: Water Absorption, Dielectric constant and losses, Hydrophobicity and Thermal Analysis.

### c. Ceramics Insulators and pollution

There are many heavy polluted areas in Indonesia. The pollution may be industrial, salt/coastal or sulfuric pollution. The influences of the pollution on the insulators were investigated by some groups. In order to improve the performance of ceramics insulators especially in polluted area, coating using silicone compound was introduced in some countries. However, the effectiveness of the coating in tropical region like Indonesia is under question. High ultra violet (UV) radiation intensity throughout the year and high annual rainfall are among factors should be taken into account in applying silicone rubber coating to improve the quality of ceramics insulators under heavy pollution. In this connection, investigation on the effects of silicone compound coatings on insulator under tropical condition is also carried out in our laboratory. Long term performance and aging are investigated both in laboratory and in field.

### d. Effect of Electromagnetic Field on Biological Systems

The introduction of extra high voltage of 500 kV in Indonesia has arisen concerns of the society on the effects of the electromagnetic field (EMF) to the biological systems and human being; there are some research groups in Indonesia investigating the level of the EMF caused by the lines. The effects of the EMF on biological systems such as; on mouse, chicken and fungus were also investigated.

### High Voltage Engineering Society of Indonesia.

In November 1998, 1<sup>st</sup> National Seminar on High Voltage Engineering was initiated in Bandung Institute of Technology and chaired by Dr. Suwarno. Prof. Teruyoshi Mizutani of Nagoya University and Prof. Masayuki Nagao of Toyohashi University of Technology presented invited papers at the seminar. Inter-University Forum on High Voltage Engineering (FOSTU) was established in 1999 to promote the advance of studies and researches on the high voltage engineering including electrical insulation technology in Indonesia. Since that occasion, the National Seminar on High Voltage Engineering was held annually. The 2<sup>nd</sup> Seminar was held in Gajahmada University. Prof. Kobayashi from Saitama University and Prof. van der Laan from Eindhoven Technical University delivered invited lectures. The 3<sup>rd</sup> seminar was held in Indonesia University, Jakarta. Mr. Iwa Garniwa chaired the seminar and special presentations were given by Prof. Shamir Shihab from Royal Melbourne

Institute of Technology and Prof. M. Nagao from Toyohashi University of Technology. This year the 4<sup>th</sup> National Seminar on High Voltage Engineering is scheduled to be held in Batam Island 5 – 6 November 2001 in conjunction with Seminar on Electric Power Tariffication. 80 technical papers will be presented. FOSTU also published The Indonesian Journal on High Voltage Engineering since its inception in 1999. By the end of 2002, a Regional Conference on High Voltage Engineering will be held in Bandung. The conference will be co-sponsored by FOSTU, Bandung Institute of Technology and HEDS-JICA.

In November 1998, Bandung Institute of Technology has also hosted the 9<sup>th</sup> Asian Conference of Electric Discharge (ACED) which has been attended by more than 150 people coming from Japan, Korea, Thailand and Indonesia.



Participants of 9<sup>th</sup> Asian Conference of Electric Discharge (ACED), hosted by ITB

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# Electric Power Industry in Vietnam : the Overview



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Vietnam is a developing country which recently experienced rapid growth in economy. The growth rate is averaged around 9% per year from 1993 to 1997 and 7% from 1998 to 2000. Naturally, electric power industry became one of the most important and biggest economic sectors in term of capital investment and its development speed. Every year, it required 1.5 billions USD for investment (about 1.1% of GDP). This article will present some general information about organization and operation of electric power industry in Vietnam.

Presently, electric power sector is under control of Vietnamese government; in other words, it is national institution named Electricity of Vietnam (EVN). EVN is operated under direct supervise of Ministry of Industry. Under EVN, generally, the business is divided into three sectors which are responsible for electrical generation plants; electrical transmission lines and electrical distribution systems plus one national electric power system coordination center. There are also supporting institutions inside EVN: research institute (institute of energy); testing center; information center.

Operation of EVN will be presented with some statistical figures described bellow.

## 1. Structure of Electric Generation and Transmission.

By 31/December/1999, the general output capacity of all electric generation plants in Vietnam is 5,384 MW in which 53.2% come from hydro-electric plants; 11.3% from coal-consumed

plants; 15.1% from oil and diesel-consumed plants and 20.4% from gas turbines (Fig.1). According to the fig.1, the electric generation in Vietnam is heavily depended on hydro-electric plants. During dry season (from January to May), the output of hydro-electric plants is falling because of lack of water supply while electrical consumption increases. This sometime causes serious black out of the whole electrical system. In order to overcome this problem, presently, EVN is working on projects of constructing more oil-consumed and gas turbine generation plants.

The transmission system consists of one ultra-high voltage 500kV line from North to South Vietnam with the length of 1,487km and network of 110, 200kV lines connected with this 500kV line. The total length of transmission lines (110, 220, 500kV) is about 8,000km. The distribution system consists of 35, 10 and 6kV-distribution network and substations. The total capacity of distribution stations is 7,166kVA. In the daily life, consuming voltage is 220V.

## 2. Electric Consumption Structure (by 1999)

Total electric consumption in 1999 is 19,592 GWh, in which 7,590GWh is from industrial sector; 582GWh from agricultural sector; 10,020GWh from household sector and 1,400GWh from service and transportation sector. They are shown in Fig.2. According to this figure, the electrical demand of household sector occupied over 50% of total demand; moreover it is the main sector which has been creating the peak of load.

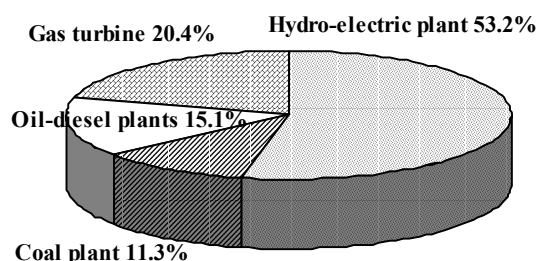


Fig.1 Structure of Electric generation

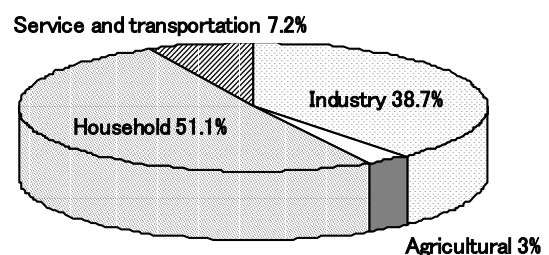


Fig.2 Electric consumption structure