
OUTLINE OF TECHNICAL COMMITTEES ON DEI AND RELATED TC IN IEEE

Technical Committee on Dielectrics and Electrical Insulation (DEI)

Chairperson: Y. Ohki (Waseda University)
 Secretaries: R. Takeuchi (Hitachi Corp.)
 T. Okamoto (Central Research Institute of Electric Power Industry)
 Assistant Secretaries: H. Miyata (Fujikura Ltd.)
 Y. Tanaka (Musashi Institute of Technology)

This Technical Committee (TC-DEI) was set up in 1979 succeeding the Permanent Committee on Electrical Insulating Materials at the reorganization of IEEE. The activities of the Committee are covering mainly solid and composite dielectric and insulating materials and technology.

The primary activity of TC-DEI is the annual Symposium of Electrical and Electronic Insulating Materials and Applications in Systems, formerly called Symposium on Electrical Insulating Materials. In 1997 the 29th Symposium was held at Central Electric Club in Osaka on Sept. 30 and Oct. 1. Sixty-eight papers were presented including the invited paper of Prof. E. Gockenbach of Universität Hannover, Germany. The 30th Symposium in 1998 was jointly held with IEEE DEIS, Chinese Electrotechnical Society and Korean IEE in the style of International Symposium (ISEIM-98) in Toyohashi from Sept. 28 to 30, 1998, and ended very successfully. The numbers of papers and participants of ISEIM-98 respectively exceeded 200 and 180, beyond our expectation. The 31st Symposium will be held at the TEPCO R & D Center in Yokohama on November 16 and 17, 1999. The next ISEIM will be held jointly with the 34th Symposium in 2002, although its details have not been determined.

The TC-DEI organizes the Seminar for Young Researchers of Dielectrics and Electrical Insulation every two years. Its 27th meeting will be held on November 19 and 20, 1999.

The TC-DEI currently runs seven Investigating Committees (IC) which organize Technical Meetings (105 papers in 1998) and one Cooperative Research Committee (CRC) which edits and publishes this EINA.

Table 1 Investigation Committees in TC-DEI

Research Subject	Chairperson
Interfacial Electronic Phenomena and Intellectual Properties of Organic Thin Films (3 years from Apr. 1997)	M. Iwamoto (Tokyo Institute of Technology)
Standardization of Space Charge Measurement in Dielectric/Insulating Materials (3 years from Apr. 1997)	T. Takada (Musashi Institute of Technology)
Structure and Functions of Molecular Ultrathin Films, Organic Thin Films and Interfaces (3 years from July 1997)	F. Kaneko (Niigata University)
Electrical Insulation News in Asia (EINA) (2 years from Apr. 1998)	H. Yamashita (Keio University)
Mechanism of Treeing Degradation and Influence of Polymer Morphology (3 years from Apr. 1998)	N. Shimizu (Meijo University)
Evaluation and Improvement Methods of Insulation Interfaces (3 years from Jan. 1999)	T. Tanaka (CRIEPI)
Insulation Reliability of Electronic Equipment (2 years from Apr. 1999)	T. Tsukui (Tokai University)
Insulation Lifetime of Dielectric Materials and Electrical Apparatus (3 years from Apr. 1999)	T. Ito (Musashi Institute of Technology)

Technical Committee on Plasma Science and Technology (PST)

Chairperson : M. Katsurai (University of Tokyo)
Vice Chairperson : S. Ishii (Tokyo Institute of Technology)
Scientific Secretary : S. Ono (Musashi Institute of Technology)
H. Sugai (Nagoya University)
Scientific Assistant : K. Yasuoka (Tokyo Institute of Technology)

The Technical Committee on Plasma Science and Technology (TC-PST) was founded in April 1999. This committee has the basis on the plasma researcher's society that has organized Plasma Research Symposia several times every year since about 30 years ago. The field of activity of this committee includes researches and investigations of various plasmas in terms of plasma physical parameters as density, temperature and ionization degree, and application fields as nuclear fusion, plasma processing, and plasma chemistry.

The major activity of this committee is to succeed to organize the Plasma Research Symposia. Since April 1999, three symposia were held; in June at Osaka University, in September at Waseda University in Tokyo and also in September at National Institute of Fusion Science in Toki City followed by a study tour to the Large Helical Device (LHD) for fusion research. Once or twice every two years, symposium will be held outside Japan as Korea and Taiwan in collaboration with their domestic societies related to plasma science and technology. At each symposium, about 20 to 30 presentations are made. Presentations by young researchers in bachelor course and master course are strongly encouraged and appreciated.

TC-PST currently runs one investigation committee, and, a few new will be set up in future.

Table1. Investigation Committee in TC-PST

Research Subject	Chairperson
Plasma-based Ion Implantation (3 years from June 1999)	K. Yukimura (Doshisha University)

Technical Committee on Electromagnetic Compatibility (EMC)

Chairperson : T. Takuma (Kyoto University)
Secretaries : Z. Kawasaki (Osaka University)
S. Yokoyama (Central Research Institute of Electric Power Industry)
Assistant Secretary : K. Miyajima (Central Research Institute of Electric Power Industry)

This new Technical Committee (TC-EMC) started in April 1999 in the Fundamentals and Materials Society (A-Society), the Institute of Electrical Engineers of Japan (IEE, Japan). It followed the breaking-up of the former Technical Committee on Applied Physics of Electricity (APE) into four technical committees.

Our modern life today is full of electromagnetic fields due to naturally-originated sources like lightning as well as artificial ones in almost all kinds of frequency. These sources make complex electromagnetic environments which usually give necessary benefits to and sometimes on the other hand interfere with every aspect of our life. The EMC (electromagnetic compatibility) issues are increasing their importance more and more with the recent development of the electricity-dependent life.

The issues have already been actively studied, for example, by a Research Committee (EMCJ) in the Institute of Electronics, Information and Communication Engineers (IEICE), Japan. The establishment of the TC-EMC in the IEE, Japan is based on the increasing significance of the field together with the fact that both sources and influences in the EMC issues have a close relation with electrical engineers.

The TC-EMC deals with the following items as the scope of its investigation activities.

- a) Generating sources of electromagnetic interferences, related to high voltage, static electrification, high current, electrical discharge, power electronics devices, and so on.
- b) Actual situations of electromagnetic interferences
- c) Measuring techniques in EMC
- d) Countermeasures against electromagnetic interferences
- e) Domestic and foreign standards related with EMC

The TC-EMC plans to start two investigation committees in the fiscal year 1999 up to March 2000. One of them, Investigation Committee on Lightning Damages in the Highly Information-Oriented Society, was already approved to begin its activity in January 2000. The chairperson is Dr. S. Yokoyama in the Central Research Institute of Electric Power Industry. It intends to investigate various aspects concerning damages caused by lightning with the term of about two years until March 2002. The investigation items are to cover, for example, countermeasures in low-voltage networks for electronics and communication, related standards abroad, techniques for analyzing lightning damages, and cost estimations.

Technical Committee on Pulsed Electromagnetic Energy (PEE)

Chairperson	Kiyoshi Yatsui (Nagaoka university of Technology)
Vice Chairperson	Shozo Ishii (Tokyo Institute of Technology)
Secretaries	Kazuhiko Horioka (Tokyo Institute of Technology)
Assistant Secretary	Weihua Jiang (Nagaoka university of Technology)

The Technical Committee on Pulsed Electromagnetic Energy (TC-PEE) has been set up just recently, on July, 1999, to offer the opportunities for the members of IEE of Japan in the fields of the R & D on pulsed power technology and associated applications.

It has been successfully available to achieve extremely high energy density state by the pulsed power technology, for a very short time duration, though. To study it from various points of views is very important not only from a physical aspect, but also from a lot of applications. Such an extreme state achieved is closely correlated with many applications because it involves extremely high temperature, high pressure, high electric field, high density, high magnetic field strength, and so on. In this technical committee, the main themes concerned are ① the development of pulsed power technology, ② the achievement of extremely high energy density by being transferred to many kinds of beams, and ③ the associated applications. Although there has been growing number of scientists in this particular fields of interests, there have been no systematic activities in Japan. The establishment of this technical committee will be very useful in various aspects not only from electrical engineering but also from other related engineering and technologies. Regularly, four Technical Committee meeting will be held per year.

As of 1999, there is one investigation committee in TC-PEE. The research subject is called as "Production and Control of Pulsed Extremely High Energy Density State". The chairperson, vice chairperson, secretary and assistant secretary are Kiyoshi Yatsui (Nagaoka University of Technology), Shozo Ishii (Tokyo Institute of Technology), Kazuhiko Horioka (Tokyo Institute of Technology), and Weihua Jiang (Nagaoka University of Technology), respectively. Regularly, there will be four meetings per year. In 2000, some other technical committees will be settled.

The main themes to be studied and discussed in the regular research meetings (Pulsed Power Technology: PPT) are written in the following: ① development of pulsed power technology (e.g., power supply, switches, insulation technology), ② energy transfer technology of pulsed power (e.g., electron beam, ion beam, neutral beam, laser beam, pinch discharge, plasma focus), ③ production, control, evaluation/diagnostics, theoretical and computer simulation of extremely high energy density state, ④ applications of extremely high energy density state (e.g., microwave, materials, environment, radiation source, particle acceleration, flier acceleration, strong electromagnetic wave, free electron laser, X-ray laser, excimer laser, ultrahigh pressure/density/temperature/magnetic field strength, inertial confinement fusion, luminescence/display, diagnostics), and ⑤ others.

The regular research meetings (PPT) are open to participate to everybody who are interested in the pulsed power technology and associated applications.

Technical Committee on Electrical Discharge (ED)

Chairperson:	K. Hidaka (The University of Tokyo)
Secretaries:	M. Yumoto (Musashi Institute of Technology)
	M. Nagao (Toyohashi University of Technology)
Assistant Secretaries:	T. Nakano (National Defense Academy)
	M. Hanai (Toshiba Corporation)

The Technical Committee on Electrical Discharge (TC-ED) has been charged with offering the opportunities for the members of IEE of Japan in the research field of electrical discharge to present their achievements, and studying and reporting on current status and future challenges in electrical discharge engineering. It was established formally in 1980, but its root goes back to the start of Expert Committee on Electrical Discharge in 1954. In order to meet the objective, a few subcommittees are organized in the TC-ED every year to survey the up-to-date subject and their activities continue for three years normally.

In the past, the following subcommittees were active and published the Technical Research Reports on a relevant subject: Discharge Simulation Methods, Surface Discharges in Diverged Fields, V-t Characteristics in SF₆, Conduction and Breakdown in Dielectric Liquids, Plasma Processing, Fundamental Processes in Non-LTE Plasma, Simulation in Non-LTE Plasma, Field Measurements in Electrical Discharges, Breakdown Mechanism and Characteristics of Gas Mixtures, Modeling of Long Sparks, Interaction between Sparks and Laser, Space Charge Effects on Electrical Breakdown in Insulating Liquids, Effects of Interface and Foreign Matters on Electrical Breakdown in Insulating Liquids, High Stress Phenomena in Cryogenic Liquids, Plasma Reactors, Plasma Display, Database on Gas Discharges, Beam and Swarm Data for Gas Discharges and Plasma; Plasma Chemistry, Electrical Breakdown in Vacuum, and so on. The total number of the past subcommittees is 36 and the published technical reports reach 29 at the end of 1997.

Now eleven subcommittees are running for a survey of the listed subjects. Each subcommittee consists of 20-30 members who are the specialists in the relevant research subject or are interested in it.

The TC-ED is supporting more than ten domestic research meetings on electrical discharges every year where almost 250 full papers are reported by professors, scientists and students from universities and institutes and engineers from industries.

In 1998, "Handbook of Electrical Discharge" was completely revised after an interval of twenty-five years through the active support of the TC-ED. This handbook has a special advantage of including two discs of CD-ROM in which full text of it, database on electrical discharge and useful simulation software are stored, together with two volumes of hardcopy of total 1000 pages. The publication project of the handbook won 1998 Group Writing Award of IEE Japan.

The international and domestic conferences and annual seminar for young researchers are also promoted by the TC-ED in cooperation with the Technical Committee on Dielectrics and Electrical Insulation, IEE of Japan, the Institute of Electrostatics of Japan and the Japan Research Group on Electrical Discharge which consists of about 400 members whose backgrounds covers a wide area of electrical properties of solids, liquids and gases.

Table 1 Investigation committees in TC-ED

Research Subject	Chairperson / Secretaries / Assistant Secretaries
Plasma Properties for Technique of Promising Prospective Plasma-Processing	M. Sugawara / M. Ouchi, S. Ono / A. Matsuoka
Charged Particle Generation and Emission in Vacuum and Related Technologies for Controlling Electrical Discharges	S. Kobayashi / Y. Saito, M. Yumoto / Y. Suetsugu
Conduction and Breakdown Characteristics in Dielectric Liquids and their Applications to Electric Power Apparatus	H. Okubo / K. Kojima, N. Hayakawa / S. Yamada
Discharge Plasma Applications for Environmental Protection	T. Oda / H. Itoh, K. Soma / K. Simizu
Modeling of Nonequilibrium Plasma and Related Plasma Etchings	T. Makabe / H. Kouno, S. Samukawa

Pulsed Power Discharges and their Applications	H. Akiyama / T. Sakukawa, Y. Nakazawa / J. Katsuki
Plasma Display Discharge and Emission	S. Mikoshiba / S. Hashiguchi, T. Yoshioka
Gas Insulation Technology for prospective future transmission and substation apparatus	M. Hara / T. Gouda, H. Fujii / N. Hayashi
Physical and Chemical Reaction of Electrons, Ions and Excited Particles in Discharge Plasma	H. Itoh / Y. Nakamura, Y. Saito / S. Suzuki
Ultra Long Discharge Characteristics	T. Shindo / S. Matsumoto, N. Takagi / M. Miki
Construction and Application of Database on Surface Discharge	M. Endo / M. Chiba, S. Matsumoto

Technical Committee on High Voltage Engineering (HV)

Chairperson:	M. Ishii (The University of Tokyo)
Secretaries:	A. Inui (Toshiba Co.) I. Aono (Mitsubishi Electric Co.)
Assistant Secretary:	H. Motoyama (Central Research Institute of Electric Power Industry)

This technical committee (TC) belongs to Power & Energy (P&E) Society of the IEE of Japan. This committee supervises activity of investigation on technical subjects related to high voltage engineering. Six investigation committees listed in Table 1 are active in October 1999. The scope of this TC resembles, but is broader than, that of the CIGRE Study Committee 33 (Power System Insulation Coordination).

In January 1999, TC on High Voltage Engineering jointly organized 1st International Workshop on High Voltage Engineering (IWHV) with TC on Switchgear and Protection, which also belongs to P&E Society of IEEJ. The workshop was successfully held at University of Ryukyus in Naha on the Okinawa Island attended by 97 participants from 7 countries. Selected papers from this workshop will appear on January 2000 issue of Trans. of IEEJ, P&E Society, as a Special Issue on IWHV.

Based on this success, 2nd Workshop is planned during Nov. 1-2, 2000 at Tottori City in the week just before Asian Conference on Electrical Discharge in Kyoto. At this Workshop, cooperation with other technical committees is extended to include TC on Electrical Discharge, belonging to Fundamentals and Materials Society. Several ordinary technical meetings are jointly organized every year with these two TCs, Switchgear and Electrical Discharge.

TC on High Voltage Engineering meets four times a year, and a technical visit to the new HVDC station in Wakayama is planned in the fall of 1999. The members of the committee other than the chairpersons of the investigation committees are from universities (4), research institute (1), electric power utilities (4) and manufacturers (9).

Table 1 Investigation Committees in TC-HV

Research Subject	Chairperson
Insulation and Surge Characteristics of Equipments on Distribution Line	S. Yokoyama (CRIEPI)
Electric and Magnetic Phenomena Associated with Earthquakes	K. Horii (ex-Daido Institute of Technology)
Lightning Location Systems	M. Ishii (The University of Tokyo)
Status Quo in Insulation Coordination	S. Sasaki (CRIEPI)
Systematization of Techniques in Analysis of Lightning Surges in Electric Power Systems	A. Ametani (Doshisha University)
Insulator Contamination (Application and Evaluation of Insulators under Variety of Environments)	K. Takasu (CRIEPI)

Technical Committee on Electrical Wire and Cables (EWC)

Chairperson	Y. Sekii (Chiba Institute of Technology)
Secretaries:	S. Maeda (Mitsubishi Cable Industries, Ltd.)
	I. Shigetoshi (Fujikura Ltd.)
Assistant Secretaries	K. Iwasaki (The Furukawa Electric Co., Ltd.)

Technical committee on electrical wire and cables (TC-EWC) is the committee organized in IEEJ Power and Energy Society, with the committee members from universities, power and communication utilities, the railway company and cable manufacturers. The committee supervises the investigation committees dealing with the subjects concerning electrical wire and cables. In the past, such investigation committees as the investigation committee on DC cables, the committee on PD (partial discharge) detection technology and the committee on accessories for power distribution cables, have been organized. Those investigation committees published such technical reports entitled as "PD Detection Technologies Applicable to Power Cable Lines" or "Design, Construction and Testing of Terminations and Joint for Power Distribution Cable Lines". Two investigation committees are currently running. Their names and chairpersons are shown in Table 1. In addition to organizing those investigation committees, the technical committee holds the technical meeting to promote R&D activities for engineers in this field and provide opportunities of presenting the results of their technical achievements. Three technical meetings are planned during the fiscal year in 1999. The TC-EWC usually meets 4 times a year. One of the meetings is held with a technical visit by the committee members to facilitate understanding the trends of advanced science and technology. This year the committee members visited a high-rising residence named Elza-Tower, which is located in the suburbs of metropolitan area and equipped with the most advanced facilities.

Table 1 Investigation Committees in TC-EWC

Research Subject	Chairperson
Investigation Committee on Technology of Wires and Associated Accessories	T. Tanaka
for Overhead Transmission lines	M. Okada
Investigation Committee on Computer Software and Its Application for Underground Cable Lines	