

OUTLINE OF TECHNICAL COMMITTEES ON DEI AND RELATED TC IN IEEJ

Technical Committee on Dielectrics and Electrical Insulation (DEI)

Chairperson:	Y. Ohki (Waseda University)
Secretaries:	K. Kimura (Mitsubishi Electric) T. Okamoto (Central Research Institute of Electric Power Industry)
Assistant Secretaries:	M. Okashita (Showa Electric Wire and Cable) H. Nishikawa (Shibaura Institute of Technology)

This Technical Committee (TC-DEI) was set up in 1979 succeeding the Permanent Committee on Electrical Insulating Materials upon the reorganization of IEEJ. The activities of the Committee have been covering mainly solid and composite dielectric materials and their technologies.

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 1999, the 31st Symposium was held at the TEPCO R & D Center in Yokohama on November 16 and 17, 1999. Seventy eight papers were presented including two invited papers by Prof. M. Hanack of University of Tübingen, Germany, and by Dr. M. Leijon of ABB, Sweden.

The 32nd Symposium will be held in Nagano on November 16 and 17, 2000. Prof. L. A. Dissado of Leicester University and Prof. M. Taylor of Wales

University, both from U. K., will be invited speakers. Special sessions on "Eco-friendly insulation technologies" and "International standards" are organized. Including these topical papers, 91 papers will be heard.

The 33rd Symposium in 2001 will be held in Himeji on November 19 – 22, jointly with IEEE DEIS, Chinese Electrotechnical Society, and Korean Institute of Electrical and Electronic Material Engineers in the style of International Symposium (ISEIM 2001). The details of ISEIM 2001 can be seen on its web site: <http://www.waseda.ac.jp/conference/ISEIM2001/index.html>

The TC-DEI currently runs seven Investigating Committees (IC) which organize Technical Meetings (97 papers in 1999) and one Cooperative Research Committee (CRC) which edits and publishes this EINA.

Table 1 Investigation and Cooperative Committees in TC-DEI

Research Subject	Chairperson
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 Problems of Electronic Equipment (3 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)
Development of Dielectric and Electrical Insulation Technology to Organic Molecular Device Engineering (3 years from Jan. 2000)	M. Iwamoto (Tokyo Institute of Technology)
Future Prospects of Electrical and Electronics Insulation Technologies (2 years from Apr. 2000)	T. Tanaka (CRIEPI)
EINA Magazine (2 years from Apr. 2000)	T. Tanaka (CRIEPI)
Functions of Organic Molecular Films and Organic/Inorganic Composites (3 years from July 2000)	F. Kaneko (Niigata University)

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 established subcommittees is 39 and the published technical reports reach 29 as of September 2000.

Now ten 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, researchers and students from universities and institutes and engineers from industries.

The "Handbook of Electrical Discharge" was revised in 1998 after an interval of twenty-five years through the active support of the TC-ED. The new 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 this handbook won the Authors Group Award of IEE Japan last year. The second edition of the handbook has been published.

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
Technology of Material and Gas Treatment by Using Plasma Processing	M. Sugawara / M. Ouchi, S. Ono / A. Matsuoka
Control Technology of Electrical Discharge in Vacuum Relevant to Generation of High Energy Density	M. Yumoto / Y. Saito, O. Yamamoto /
Behavior of Charged Particles in Liquid and its Simulation Technique	Y. Sakai / R. Hanaoka, Y. Nakagami / S. Mori
Construction and Application of Database on Surface Discharge	M. Endo / M. Chiba, S. Matsumoto /
Ultra Long Discharge Characteristics	T. Shindo / S. Matsumoto, N. Takagi / M. Miki
Physical and Chemical Reaction of Electrons, Ions and Excited Particles in Discharge Plasma	H. Itoh / Y. Nakamura, Y. Saito / S. Suzuki
Gas Insulation Technology for Prospective Future Transmission and substation apparatus	M. Hara / T. Gouda, H. Fujii / N. Hayashi
Plasma Display Discharge and Emission	S. Mikoshiba /

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)

The 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.

The TC-EMC is in charge of various issues related to electromagnetic compatibility in electrical engineering. Our modern life today is full of electromagnetic fields due to naturally-originated sources like lightning as well as artificial ones in almost all ranges 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 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 has started two investigation committees(ICs) in 2000. One of them, the Investigation Committee on Lightning Damages in the Highly Information-Oriented Society, began 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.

The other is the Investigation Committee on EMC Issues in the Electric Power Industry, which Associate Professor Z. Kawasaki of Osaka University chairs. Although there exist a number of EMC issues already examined by various organizations, the principal purpose of this new IC is to extract such recently noticed or important items as have been not fully elaborated in the electric power industry. The IC also intends to make mathematical simulation models of simulation models of possible EMC phenomena.

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. Five investigation committees listed in Table 1 are active in October 2000. The last two committees in the table were newly formed in the past year. The scope of this TC resembles, but is

broader than, that of the CIGRE Study Committee 33 (Power System Insulation Coordination).

This TC jointly organizes 2nd International Workshop on High Voltage Engineering (IWHV) in November 2000 at Tottori, Japan, with two other TCs, namely on Switchgear and Protection, which also belongs to P&E Society of IEEJ, and on Electrical Discharge. This workshop, chaired by the chairperson of the TC on High Voltage Engineering, is characterized by discussion on full-length papers in English, and selected papers will constitute a special issue of Trans. IEEJ to be published in summer of 2002. The previous workshop held in

Naha, Okinawa collected 49 papers and its special issue of January 2000 comprised 15 papers from the workshop.

TC on High Voltage Engineering meets four times a year, and a technical visit to a geothermal plant, a wind power station and a diesel power plant on the Hachijo Island, 300km south of Tokyo, is planned in October 2000. The members of the committee other than the chairpersons of the investigation committees are from universities (4), a research institute (1), electric power utilities (4) and manufacturers (9).

Table 1 Investigation Committees in TC-HV

Research Subject	Chairperson
Lightning Location Systems	M. Ishii (The University of Tokyo)
Status Quo in Insulation Coordination	S. Sasaki (CRIEPI)
Insulator Contamination (Application and Evaluation of Insulators under Variety of Environments)	K. Takasu (CRIEPI)
Common Electrical Insulation Technology in Power Apparatuses of Electric Power System	H. Okubo (Nagoya University)
Estimation of Lightning Performance of Distribution Line	M. Ishii (The University of Tokyo)

Technical Committee on Electrical Wire and Cables (EWC)

Chairperson:	Yasuo Sekii (Chiba Institute of Technology)
Secretaries:	Ikuo Shigetoshi (Fujikura Ltd.) Kunio Iwasaki (The Furukawa Electric Co., Ltd.)
Assistant Secretary:	Kazuhito Mizunami (Sumitomo Electric Industries, 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 technical committee holds the technical meeting to promote R&D activities in this field and provide opportunities of presenting the results of technical achievements. Three technical meetings are planned in this year. One of the meetings has been held on September 13, 2000, in Tokyo focused on the subject of High Voltage DC Cables. In addition to organizing those technical meetings, the technical committee supervises investigation committees which deal with updated subjects concerning electrical wire and cables. During these several years, investigation committees such as "The Investigation Committee on Partial Discharge Detection Technology for Power Transmission Cable Lines", "The Investigation Committee on DC

Cable Systems" and "The Investigation Committee on Examining Technical Trends in Power Cable Systems in Abroad" were organized. Those investigation committees have published technical reports such as "PD Detection Technologies Applicable to Power Cable Lines" or "Recent Technical Trends in DC Cables". The same as the previous year two investigation committees are running current year. The names and chairpersons of them are shown in Table 1.

The TC-EWC usually meets 4 times a year. Sometimes a technical visit by the committee members is planned to encourage studying most advanced science and technology. In this year, the committee is planning to visit the "Yura Switchyard" in Kansai Electric Power Co., Inc., where the cable terminations of high ampacity DC 500 kV oil-filled cable system for the "Kii Channel Link" (cable line length: 50km, conductor cross-section: 3000 mm²) have been constructed.

Table 1 Investigation Committees in TC-EWC

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

IEC Japanese National Committees Related to Electrical Insulating Materials

IEC TC10 Japanese National Committee

Chairperson T. Ishii (Yuka Industries Co.,Ltd)
Secretary T. Takahashi (Fujikura Ltd)

IEC TC 10 deals with standards of fluids (insulating liquid and SF₆) applying to electrical equipments such as transformer, cable, condenser and switchgear. Japanese National Committee consists of 19 experts from universities, manufacturers of power apparatus, cables and insulating oils and testing companies. In 1999 two standards (IEC 61620 and IEC 60599) were published. Now 6 WGs (WG14,15,16,17,18 and 19) and a maintenance team (MT-21) are acting. Japanese National Committee contributes to the WGs and MT. Many members of the committee also belong to the committee of electrical insulating oil in Japanese Petroleum Institute and the latter committee investigates adjustment between JIS (Japanese Industrial Standard) and IEC standards.

IEC SC15C Japanese National Committee

Chairperson Tsuyoshi Kaneko (Japan Electrical Safety & Environment Technology Lab.)

SC15C that is under the influence of IEC/TC15 is responsible for standardization of insulating materials except gases and liquids at use. As insulating materials are used throughout all the fields of electrical and electronic machine and have diversity, the number of investigations results so large amounts, that involve the review of 116 standards to be taken charge and drafts for standards. Still more, two reasons cause to increase the amount of works of SC15C. One is evaluation for SC working by counting the standards made in a year, and another is a strategic policy of material manufacturer who has large share in the world. The amount of the works for SC 15C should be reduced through the discussion of all TC and SC members. Japanese national committee submitted a proposal for simplifying the

works at Frankfurt meeting in June 2000 and the proposal was adopted.

IEC SC15E Japanese National Committee

Chairperson E. Watanabe (Tokyo Metropolitan University)

The committee is a subcommittee dealing with testing methods of electrical insulating materials. It is composed of four task groups each of which manages some IEC documents concerning to its designated standards and fields. It often plays a role of the committee for enactment/ revision of JIS standards. The committee recently contributes the revision of IEC 60112 (Tracking test) and enactment of IEC IEC 60250 (Dielectric characteristics)

IEC TC98 Japanese National Committee

Chairperson S. Kobayashi (Niigata College of Technology)
Secretaries K. Kimura (Mitsubishi Electric Corp.),
T. Okamoto (Nagoya University)

IEC TC98 was established in 1994 after disbanded TC63 to prepare IEC documents on Electrical Insulation Systems (EIS). TC98 plays an important role as Horizontal Technical Committee. The international meeting of TC98 has been held once a year since 1995. The 5th meeting was held in Tokyo and Kyoto, Japan in Oct.1999. TC98 Japanese National Committee consists of experts from MITI (Ministry of International Trade and Industry), universities, laboratories and manufacturers of power apparatus, cables and instruments. The Japanese committee has large contribution to WG activities on thermal evaluation (WG5,6) and voltage endurance of EIS under repetitive impulses from power electronics (WG4).