Electrical Insulation News in Asia

No.5 *September 1998*

IEEJ

CONTENTS

PREFACE

Dr. T. Tanaka

Frequency Matching of Signals in Asia among Transmitters and Receivers

We have transmitted some information on dielectrics from Japan to your Asian countries via this brief article named "Electrical Insulation News in Asia" every year to cooperate in the field of science and technology of dielectrics and electrical insulation. I might think that we use a specific frequency spectrum to disseminate information. Do you think our frequency spectrum under which you have received our signals is matched to yours? Mismatch, if any, seems to be a big problem.

We, Asian dielectric people, have certainly a forum through which we see each other regularly to exchange views on the matters of our common interest and grow our friendship to foster mutual cultural and technological understanding. The forum is given by Asian international conferences we organize together, as you know well. In reality, we got together at the International Conference on Properties and Applications of Dielectric Materials in China, Japan, Korea and Australia, and at some other Asian conferences such as the Asian International Conference on Dielectrics and Electrical Insulation, the Korea-Japan Conference on Electrical and Electronic Materials, and the Japan-China Conference on Electrical Insulation Diagnosis. We tried to make frequency tuning in appropriate manner in these occasions. But it is not sufficient.

Our interest might be divided roughly into the following three categories:

(1) Existing electrical insulating materials and systems
(2) Advanced electrical insulation systems, and
(3) Simple and reliable dielectric diagnostic methods.

Electrical insulation seems to be stabilized in developed countries and then to be difficult to expand rapidly from now on. We can expand it from electrical insulation to electronics insulation that is subjected to very high electric field under low voltage. Several advanced materials emerge and are expected to work intelligently in certain cases. Existing established insulation technology should be transferred to other countries. Diagnostic methods have been established in some cases, and should be improved and/or endowed with rapidly developing intelligence technologies. I personally think the subjects I stated above are shared by all of you as your interest.

In all the activities we can devote together to our societies, we need frequency tuning among ourselves with high Q value in order to work as effectively as possible. For that purpose, we have to devise some mechanisms such as an internet home page and some other stronger interactive tools, but for the time being we will continue to send EINA. You would kindly tell us on the frequency matching and mismatching of the signals we will transmit, so that our activity might be more or less interactive and multilateral and will be certainly so in the future to minimize frequency mismatching.

Dr. Toshikatsu Tanaka
(Vice President, Central Research Institute of Electric Power Industry)

EDITORIAL

Prof. M. Higaki

We present Electrical Insulation News in Asia (EINA), No. 5, in which the latest activities of some technical committees of IEEJ including a Dielectrics and Electrical Insulation (DEI) committee and investigation committees of the DEI committee and several international meetings of technical exchange between Asian countries, and others are reported.

After the DEI committee of IEEJ had investigated scientific and industrial activities related to DEI in Asia for two years, a cooperative committee on EINA was established at 1994, and EINAs have been published and presented to researchers in Asia annually. I think activities of the DEI and cooperative committees for the purpose of promoting an international exchange between Asian countries are more progressive than those of the other committees of IEEJ. The international exchange of technical information related to DEI has been going well by holding international conferences of technical exchange in Asia as described in EINAs. On the other hand, the number of foreign students studying in Japan, which is an important prop for international cultural exchange between Japan and Asia, had shown a tendency to increase steadily year after year. However, it turned to decrease after it showed a maximum of 53,787 at 1996, because the number of the students studying abroad at their own expense accounted for the majority of the students was decreased especially. The main reasons are considered to be the change of needs for studying abroad caused by better preparation or improvement of the institutions of higher education in Asia and the latest severe business depression in Japan and Asia. Considering about 90% of the foreign students studying in Japan come from Asia at present, the international cultural exchange of the students between Asia and Japan including our University should be reviewed in the future.

Today, Japanese business is suffering from a serious slump, and we have no idea when our business recovery will come. Since we have built up a world leading business situation based on the manufacturing ability of many industrial products including high technologies, we should promote to develop new technologies and products in those strong fields and make way for our business recovery. As to DEI technology, it can be considered that we have high research level in the world and our technologies are perfectly matched to those of USA and Europe. To continue contributing to technology development in Asia, the advancement of all engineer's creativity and applicability to the field of DEI will be more desirable. Close cooperation between industries and universities in Japan and between Asian countries is more important for that purpose.

EINA is dispatched from Japan at present. I think it would be preferable if Asian researchers partake in the edition of EINA or the essence of outstanding Japanese and Asian technologies related to DEI is introduced in EINA. I hope EINA will act as a superior medium of communication between Asian countries.

Dr. Masaru Higaki
(Dept. of Electrical Engineering, Kyushu Kyoritsu University)

OUTLINE OF TECHNICAL COMMITTEES ON DEI AND RELATED TC IN IEEJ

Technical Committee on Dielectrics and Electrical Insulation (DEI)

Chairperson:	M. Kosaki (Gifu National College of Technology)
Secretaries:	Y. Ohki (Waseda University)
	R. Takeuchi (Hitachi Corp.)
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 IEEJ. 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 Insulating Materials (SEIM). In 1997 the 29th SEIM 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 SEIM will be jointly held with IEEE DEIS, Chinese Electrotechnical Society and Korean IEE in the style of International SEIM (ISEIM-98) in Toyohashi from Sept. 28 to 30, 1998.

TC-DEI organizes the Seminar for Young Researchers of Dielectrics and Electrical Insulation every two years. It will be held in 1999.

TC-DEI currently runs nine Investigating Committees (IC) which organize Technical Meetings (155 papers in 1997) and one Cooperative Research Committee (CRC) which edits and publishes this EINA.

Table 1 Investigation Committees in TC-DEI

Research Subject	Chairperson
High Temperature Insulation (3 years from Jan. 1996)	T. Okamoto (CRIEPI)
Deterioration of Insulation Materials and Standardization of Diagnosis for Power Apparatus (3 years from Jan. 1996)	T. Hayami (Musashi Institute of Technology)
Root Principles of Electro-Optic Conversion Functions and their New Application Fields (3 years from Apr. 1996)	K. Hidaka (Tokyo University)
Evaluation Methods of High Reliability Insulation Technology for Electronic Equipment (3 years from Apr. 1996)	T. Tsukui (Tokai University)
Interfacial Electronic Phenomena and Intellectual Properties of Organic Thin Films (3 years from Jan. 1997)	M. Iwamoto (Tokyo Institute of Technology)
Inverter Surge Insulation (2 years from Apr. 1997)	K. Kimura (Mitsubishi Electric Corporation)
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 (3years from Apr. 1998)	N. Shimizu (Nagoya University)

Activities of the Technical Committee on Electrical Discharge

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 SF_6, 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 for 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 34 and the published technical reports reach 28 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 also supporting more than ten domestic 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.

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
Interactive Relations between Electrical Discharge and Laser	T. Takuma / T. Shindo, K. Hidaka / K. Miki
Development of Data Base on Electrical Discharge in Gas	K. Horii / T. Takano, M. Chiba
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 /

Plasma Display Discharge and Emission	T. Sakukawa, Y.Nakazawa / J.Katsuki 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

Technical Committee on High Voltage Engineering

Chairperson M. Ishii (Tokyo University)
Secretaries : T. Yabushita (Mitsubishi Electric Co. Ltd.)
A. Inui (Toshiba Corporation)
Assistant Secretary : H. Motoyama (Central Research Institute of Electric Power Industry)

The 100th meeting of the High Voltage Engineering Technical Committee will be held in the next year, which means that this committee is about 24 years old. This committee supervises investigation committees in the field of high voltage engineering except on high voltage apparatuses or on fundamentals. There are five running investigation committees in August 1997. Also, the three investigation committees will start functioning soon. Their names and the chairpersons are shown in Table 1.

It is seen from the above subjects of investigation, that the scope of this technical committee resembles, but is broader than, the CIGRE Study Committee 33 (Overvoltages and Insulation Coordination). Moreover, an investigation committee on insulation coordination is planned to start in the next fiscal year.

The technical committee plans to organize eight technical meetings in the fiscal year of 1997, five of which will be jointly organized with other technical committees of IEEJ related to high voltage engineering, such as Electrical Discharge Technical Committee or Switching and Protection Technical Committee. In January 1977, a symposium on electric and magnetic phenomena associated with earthquakes organized by the technical committee was successfully held in Osaka.

The technical committee usually meets four times a year, and one of the meetings is held associated with a technical visit by the committee members to facilities related to high voltage engineering. This year the committee members visited the testing field of a UHV prototype transformer, about 100km north of Tokyo. The members of the committee other than the chairpersons of the investigation committees are from universities (4), research institutes (2), electric power utilities (4), and manufacturers (9).

Table 1 Investigation Committees in TC-HVE

Research Subject	Chairperson
(running)	
Application of Large Current Energy Investigation Committee	T. Inaba
Insulation and Surge Characteristics of Equipments of Distribution Line	S. Yokoyama
Modeling for Advanced Evaluation of Lightning Surge Analysis	A. Ametani
Improvement of Monitoring Devices against Insulator Pollution	S. Nishimura
Measurement of High Voltage AC and DC	H. Hirayama
(To be established soon)	
Testing Technique of Impulse Voltage and Current Measuring Systems	T. Harada
Electric and Magnetic Phenomena Associated with Earthquakes	K. Horii
Lightning Location Systems	M. Ishii

ACTIVITIES OF THE TECHNICAL COMMITTEE ON DEI IN IEEJ

Digest Reports of Investigation Committees in DEI

Digest Reports on activities of investigation committee in the technical committee on DEI are reproduced here from the Proceedings of the International Symposium on Electrical Insulation Materials (Sept. 1998 Toyohashi Japan)

High Temperature Insulation

T. Okamoto (Central Research Institute of the Electric Power Industry)
M. Ishida (University of Tsukuba)
K. Kato (Mitsubishi Electric Corporation)
M. Okashita (Showa Electric Cable & Wire Co. Ltd.)

The committee was set in January 1996 with 30 members in order to survey technical information concerning high temperature insulations and their applications.

(1) Purpose of establishment

Many power equipments and cables have been compacted and applied to severer environmental use and therefore the design stress for the insulating materials increased not only in electrical stress but also in thermal stress. High temperature insulating (HTI) materials could be one of the solutions for the requirements for insulation in severer use. This committee aims to survey the modern high temperature insulating materials and their applications.

(2) Investigation Items

The committee member determined the investigation items as follows;

1) Classes and kinds of high temperature insulating materials
2) Electrical properties of HTI
3) Physical and chemical properties of HTI
4) Applications of HTI
5) Test methods of HTI performance
6) Future trends of HTI

(3) Activity

Since the establishment of the committee, fifteen regular meetings and several secretary meetings have been held. About 300 papers were presented and discussed in the committee. In January of 1997 and 1998, research meetings on high temperature insulation were held in Toyohashi and in Tokyo sponsored by the committee. The activity are now in the final stage where selected papers have been reviewed and discussed to be a Technical Report of IEEJ.

Deterioration Insulation Materials and Standardization of Diagnosis for Apparatus

T. Hayami (Musashi Institute of Technology)
T. Ito (Musashi Institute of Technology)
K. Umemoto (Toshiba Co. Ltd.)
K. Uchida (Chubu Electric Power Co. Inc.)

The committee started its three-year term activity in January 1996. It has already 2.5 years of activity passed to date. The committee consists of 34 members from universities, research institutes, power electric companies and power apparatus manufacturers.

While the diagnosis of power apparatus is an important research area to Performance failures due to the degradation of electrical insulation in advance. There are unknown phenomena still to be investigated on the degradation mechanism. The following activities have been achieved by the committee;

(1) Investigation on relationship between the fundamental degradation phenomena such as partial discharge, electrical and water trees, and various electrical signals due to the degradation.

(2) Investigation on present criteria for determination of the existence of degradation for power apparatus.

The3～33kV distribution power equipment is subject to investigation of the committee including rotating machine, Cable, transformer, capacitor and switch gear.

The committee has held 24 meetings and discussed on 231 submitted reports as on May 1998. In1996 the committee sent out questionnaires concerning insulation diagnosis of power apparatus to many industrial users. The committee has submitted nine papers to 96 Asian International Conference on Dielectric & Electrical Insulation 4th Japan-China Conference on electrical Insulation Diagnosis (96AICDEI & 4th-JCCEID), October 1996 in Xian China. The committee presented meeting of dielectrics and electrical insulation materials on IEEJ, October 1997 in Japan. The committee presented symposium on "The Future and Now of Deterioration Insulation Materials and Standardization of Diagnosis for Power Apparatus" on 1998 National Convention of the Institute of Electrical Engineers of Japan.

The committee will be dismissed in December1998.

Root Principles of Electro-Optic Conversion Functions and their New Application Fields

K. Hidaka (The university of Tokyo)
T. Takada (Musashi Institute of Technology)
Y. Murooka (Musashi Institute of Technology
T. Maeno (Ministry of Posts and Telecommunications, Comm. Res. Lab.)
N. Inoue (Mitsubishi Cables Co,Ltd.)

The plan of this investigation committee has been drawn up by Y. Murooka, T. Takada and K. Hidaka. This committee started in April 1996 after two years discussion among DEI technical committee members and will be continued until March 1999. The purpose of it is to review the fundamental functions and the physical properties of electro-optic conversion, to understand the essentials of the electro-optic conversion functions, and to propose new engineering applications. Optical measurement techniques using the electro-optic conversion such as electro-optic effect have been developed since 1970's, and some optical devices have been incorporated into electric power systems and also have been implemented to obtain a better physical understanding of dielectric discharge phenomena. Typical examples characterizing the electro-optic conversion functions are: Pockels effect, Kerr effect, Faraday effect, electro-gyration effect, magnetic Kerr effect, opto-magnetic effect, optical anisotropy of liquid crystal and so on. As each effect has been independently applied to some engineering fields, many useful effects will be systematically reviewed and discussed in this committee.

The items of survey are:

(1) Physical root principle of electro-optic conversion functions (electro-optic effect, magneto-optic effect, opto-elastic effect, nonlinear optic effect, optical phase conjugate effect, optical anisotropy),

(2) Application technology of electro-optic conversion functions (sensors, energy conversion technology, optical telecommunication),

(3) Essential components for application of electro-optic conversion functions (light sources, optical fibers, optical crystals, photodetectors, signal processing, image processing), and

(4) Feasibility of new application of electro-optic conversion functions.

This committee consists of chairperson (K. Hidaka), two secretaries (T. Maeno and S. Inoue) and 26 members from 11 universities and 15 companies. Six technical meetings are scheduled to be held in a year. One or two experts will be invited to every meeting to give lectures in their individual field relevant to electro-optic interaction and conversion and to discuss related items with committee members. The three years activity of the committee will be published in Technical Report of IEEJ.

Evaluation Methods of High Reliability Insulation Technology for Electronic Equipment

T. Tsukui (Tokai University),
Y. Yamano (Chiba University)
K. Shutoh (Science University of Tokyo),
M. Nonogaki (Mitubishi Electric Co. Ltd.)

The electric equipment is becoming small in size, light in weight,and high in performance. The printed wiring boards for the equipment are designed in fine and high density, which results in a small distance and high electric feild strength between the foil conductors on the board. The insulating failures may occur on the board under such conditions. Therefore, an insulating reliability comes up to one of the important problems for the design of electronic equipment and systems. From these viewpoints, the investigation committee started in April 1996. About 30 members joined to this committee. The main subjects of the committee are as follows.

(1) Survey On test methods for insulating failures due to the ionic migration.
(2) Comparison of factors affecting insulating failures with results from life tests.
(3) Assessment of the standard test method of insulating reliability.
(4) Research for cause of the insulation failure in electronic equipment and systems.

We have held 13 committee meetings and 4 organizer meetings since the start of this committee. To investigate the above subjects, the round robin tests of the ionic migration were carried out by more than 10 members. The round robin test carried out was an endurance test against the migration under the environmental conditions 85℃ and 85% RH. Three kinds of the insulating board were used; Bakelite board without solder coating on the foil conductors, and Epoxy/Glass-fiber boards (Fr4) with and without the solder coating on the conductors. The test pattern of the foil conductor on the board was prepared according to IPC-SM-840. The distance between the conductors was 0.16mm. The applied voltage to the conductor was dc 50V. The test was performed for more than 6,000 hours. Now we are discussing the results of the round robin test. The discussions are focused mainly on the following points.

1. Insulating resistance between the conductors or test pattern.
   1-1 Dependence of the resistance on time.
   1-2 Change in the resistance due to a generation of the ionic migration.
2. Dielectric characteristics (Capacitance and dissipation factor) for the test pattern.
   2-1 Dependence of capacitance and dissipation factor on time.
   2-2 Changes in capacitance and dissipation factor of the pattern due to a generation of the ionic migration.
3. Observation of the ionic migration.
   3-1 Microscopic observations.
   3-2 Analysis of chemical products due to the migration.
3. Assessment Of evaluation method for an endurance of the wiring board against migration.

At the end of the committee, we will publish a technical report based on the discussions shown above.

Interfacial Electronic Phenomena and Intellectual Properties of Organic Thin Films

Mitumasa Iwamoto (Tokyo Institute of Technology)
Hiroaki Usui (Tokyo University of Agriculture and Technology),
Mituyoshi Onoda (Himeji Institute of Technology)

The committee started in January, 1997 by 25 members to investigate and discuss the interfacial electronic phenomena and intellectual properties of organic thin films and will be continued until December, 1999. We have held 8 committee meetings and 4 secretary meetings up to July,1998. The main investigation subjects in the meetings are as follows.

(1) Trends and topics on the nano-interfacial phenomena in highly-ordered organic thin films and super-

structured organic films.

(2) Electrical and optical properties of Organic films arising from the nano-interfacial properties of organic films.

(3) Topics and trends on the intellectual properties of organic films.

(4) Other trends and topics concerning the interfacial phenomena for organic materials.

This committee is actively in action under various plannings such as the enforcement of the annual meeting and the symposium and the publication of the special issue, etc.

Purpose of establishment and activity

As organic materials have excellent insulating and dielectric abilities, they play an important role as covering and insulating materials for power and communication cables and other electrical equipments. However, recently the techniques of constructing highly-ordered and super-structured organic films have developed rapidly and its achievements and also essential electronically and optically functionality of organic materials have become a center of attraction. In order to utilize their functions sufficiently, the understanding on the electronic phenomena and electronic energy states on the order of nanometer scale at the molecular films/electrode interface and between quite different molecular films interface is indispensable. It seems to be the most probable that highly-ordered organic thin films will be put to practical use as an intellectual films with learning effects, etc., from the completely new viewpoints in the electrical and electronic fields.

In the present situation, we are under investigation manly that what the electronical and optical properties at the interface of highly-controlled organic thin films were clarified by what kind of techniques so far. What types of their intellectual functionality were studied so far from the viewpoints of the electronic and optical properties and then what are the subjects of this matter for a future study, etc.

That is,

(1) Trends and topics on the nano-interfacial electronic phenomena and electronic states in highly-Ordered organic thin films(super-structured molecular films).

(2) Electronic and optical properties at the nano-interface and their applications.

(3) Topics and trends on the intellectual properties of organic films.

(4) Other trends and topics concerning the interfacial phenomena for organic materials.

Since the establishment of this committee the study meeting was held 8 times up to July 1998. Furthermore, the symposium entitled "Challenge to the Molecular Electronics" on 1997 national convention of IEEJ and the annual meeting on dielectrics and electrical insulation, IEEJ entitled "Organic Thin Films" had been planned in this committee and held in March and October, 1997, respectively. And also in March, 1998, this committee gave a course in trends and topics on the electrical and optical functionality and evaluating technique for highly-controlled organic arrangement thin films sponsored by Tokyo chapter, IEEJ. The special issue entitled "The Interfacial phenomena and Function of Organic Thin Films" is expected to be published from the Transaction of the IEEJ, part A in December, 1998. The three years activity of the committee will be published in Technical Report of IEEJ.

Inverter Surge Insulation

Ken Kimura
Advanced Technology R & D Center, Mitsubishi Electric Corp. ,

Power electronics devices have been widely used for good controllability and energy efficiency. The recent development of high-voltage large-capacity devices, however, brings up new problems to insulation systems of machines driven by the power electronics. Particularly in inverter-driven induction motors, it has been pointed out that a repetitive impulse voltage due to the fast switching of power electronics devices can be hazardous to the motor insulation. Like vacuum circuit breakers which caused insulation troubles in motor winding insulation a couple of decades ago, recent large power electronics generate very fast switching surges which propagate through cables to motor. The IEE Japan started the Investigation committee of Inverter Surge Insulation since April 1997. The purpose of this committee is to survey and discuss the influence of inverter surge on the electrical insulation systems. Till the end of June 1998, we have already held 8 meetings and investigated more than 45 technical papers; half of them are presented at recent international conferences. Based up on the papers, we analyze general remarks on the research activities according to years, countries, organizations, testing method, used power devices and so on. Figure 1 shows the increase of papers for example. Especially since 1997, the number of papers

jumps double, as far as we have picked up. Figure 2 shows the ratio of author's country. Except Japanese papers, both north American and European researchers are studying the new type of aging phenomena intensively.

The papers may be classified into the following fields;

(1) General trend of power devices
(2) Analysis of the surge propagation
(3) PD inception condition with very fast rise time and/or short pulse width.
(4) Space Charge effects
(5) Multistress aging mechanism
(6) Insulation coordination

The committee is going to issue a Technical Report of IEE Japan in spring 1999, which may be the first guidelines of inverter surge insulation in Japan. International organizations such as CIGRE, IEC and IEEE also began to investigate the problem. Especially IEC/TC98 started a new working group to survey the state-of-the-art for international standardization. We hope that our report will contribute to the IEC's activities.

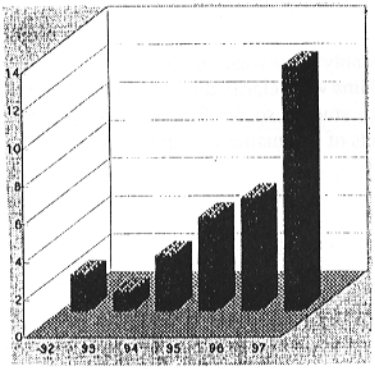


Figure 1 The increase of numbers of papers on inverter surge insulation

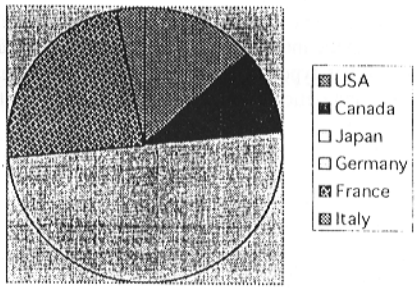


Figure 2 Country distribution of the papers

Standardization or Space Charge Measurement in Dielectrics and Insulating Materials

T. Takada and Y. Tanaka (Musashi Institute of Technology)
Y. Ebinuma (Showa Electric Wire & Cable Co. Ltd.)
K. Fukunaga (Communications Research laboratory)

The purpose of this investigation committee is to review internal space charge measuring methods : pulsed electro acoustic (PEA), laser induced pressure wave propagation (LIPP), and piezo-electric induced pressure wave propagation (PIPWP) methods, which have been widely used to evaluate insulating materials. The number of researchers on this subject has been increasing rapidly in Japan, and a useful guidebook for space charge measurement and calibration has been required in order to compare results.

This committee was established in April, 1997. There are currently 26 members from 8 universities, 6 cable manufacturers, 4 electric manufacturers, 3 electric power companies and 2 research institutes. The 3 years activity will contribute to knowledge of the internal space charge phenomena (a fundamental subject of insulation), and also to current research activities on space charge in Japan at the meetings of the new task force on space charge in CIGRE (SC15TF3).

The main subjects of the investigation are as follows ;

1. The state of the measurement system in each research group
2. Current problems with each method
3. Calibration method and a standard sample for comparing the methods

4. Methods for analyzing the obtained Signals
5. Technical guide, including DOs and DON'Ts for space charge measurement

In November 1997, the committee held a domestic technical meeting joining with other committees at Osaka, and more than 20 papers were presented from our field at the conference. The committee is going to hold a domestic technical meeting again in next November at Fukuoka, and more than 25 papers will be expected to present.

As a part of activity, the committee organized a round robin test for comparison around the measurement systems being used by committee members. From the results of the round robin test, it is confirmed that any kinds of method are available if the space charge distribution is measured with appropriate manner and the obtained signal is processed with suitable data processing technique.

The three-year activity will be published in Technical Report of IEEJ in 2000,and it will be available as a standard manual for measurement of space charge distribution.

The report will include the following subjects.

1. Principles of measurements 2. Measurement techniques 3. Typical examples for applications

Structure and Functions of Molecular Ultra-thin Films, Organic Thin Films and Interfaces

Futao Kaneko (Niigata University)
Yasuo Suzuoki (Nagoya University)
Keizo Kato (Niigata University)
Kazunari Shinbo (Niigata University)

The committee was established in July 1997,With the term of three years, The investigation has focused attention on the structure and the functions of molecular ultra-thin films, Organic thin films and interfaces related to:

1. Fabrication techniques of molecular ultra-thin films and organic thin films and evaluations of the structure,
2. New functions of molecular thin films and their interfaces,
3. Evaluations and control of optical and electrical properties at interfaces of thin films, and
4. Interface structures between different materials and evaluations of the interaction.

Up to June 1998, Six committee meetings were held. Thirteen lectures and detailed discussions among the members of the committee were carried out for their researches related to the above subjects. Furthermore, two meetings were held for lectures by distinguished non-member researchers. Observation or their research laboratories was also carried out after their lectures. The titles of the lectures were:

1. Evaluation of organic thin films using the electron microscopes,
2. Evaluation or surfaces of thin films using the electron spectroscopies,
3. Fabrications of fullerene thin films and their optical properties, and
4. Evaluation of molecular orientations in organic ultra-thin films.

There will be further lectures by the member and non-member researchers. The results of the investigation will be summarized at the end of the term.

Mechanism of Treeing Degradation and Influence of Polymer Morphology

N. Shimizu (Nagoya University)
H. Tanaka (The Furukawa Electric Co., Ltd)
M. Kanegami (Central Research Institute of Electric Power Industry)

Electrical energy is one of the most important infrastructures. XLPE cable, widely used in underground electric power transmission and distribution, plays very important role in stable electrical energy supply. Lifetime of XLPE power cable is practically decided by treeing degradation, namely electrical and water tree. The investigation of treeing phenomena is of importance concerning with reliability of electric power system.

Much effort has been paid to investigate treeing phenomena and fundamental process of initiation and propagation has been gradually clarified. However a lot of the detailed points are still unclear. Especially the influence of polymer morphology such as spherulite, amorphous, free volume etc is left unclarified, although it is essential factor to treeing phenomena.
From this viewpoint, the committee was established in April 1998 with the term of three years. The main subjects of investigation and survey of this committee are

1. Initiation and propagation mechanisms of electrical tree and the influence of polymer morphology on them.
2. Initiation and propagation mechanisms of water tree, and influence of polymer morphology on them.
3. Initiation and propagation mechanisms of electrical tree originating from water tree and the influence of polymer morphology on them.

Since the start, we have held 3 regular meetings and 3 secretary meetings. The results of investigation and survey will be published in Technical Report of IEEJ.

Electrical Insulation News in Asia

H. Yimashita (Keio University)
Y. Inoue (Toshiba Corporation)
T. Niwa, H. Miyata (Fujikura Ltd.)

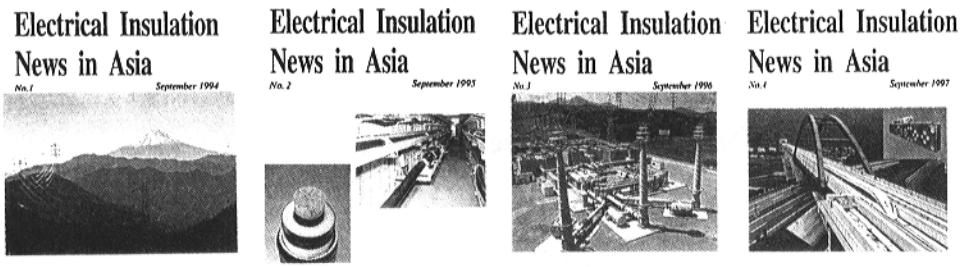
History of Committee

Preceding committee (Cooperative Research Committee (CRC) of Asian Interlink on Dielectrics and Electrical Insulation) worked from January 1991 to December 1992. The committee reviewed the present status of scientific and technical cooperation in the field of dielectrics and electrical insulation among Japan and Asian countries and sought the appropriate ways to promote it. As an important activity discussed in the committee, the "CRC of Electrical Insulation News in Asia" was established in April 1994 and edited and published "Electrical Insulation News in Asia (EINA)" No.1 (September 1994), and No.2 (September 1995). "The second CRC of Electrical Insulation News in Asia" with the term of two years was established in April 1996 and published EINA No. 3 in September 1996 and EINA No. 4 in September 1997. At the expiration of the term of the 2nd CRC, "the third CRC of Electrical Insulation News in Asia" has been establish in April 1998 in order to continue the publication of EINA news.

Activity of EINA Committee

The committee has a Chairman, two secretaries, a sub-secretary and 28 members. It has a general meeting and two or three secretary meetings a year and discusses contents for the next edition of the EINA. The third CRC will publish EINA No. 5 in September 1998 and EINA No. 6 in 1999.

The EINA will be distributed at the symposium of electrical Insulation materials and to researchers



No.1 (1994) No.2 (1995) No.3 (1996) No.4 (1997)

Front covers of back numbers of the EINA

Papers Presented at the Technical Meetings of DEI

Titles of papers presented at the technical meetings of DEI are listed below which were held from July 1997 to July 1998.

Theme: Treeing, Partial Discharge, Other Insulators in general
July 24, 1997, Akita University

DEI-97-53 Energy Flux from RF Discharge Plasma to a Substrate II.
A. Takahashi, K. Takaki, T. Fujiwara (Iwate University), M. Nagata, M. Ono (Fujikura Ltd.)

DEI-97-54 Flue Gas Treatment Using Dielectric-Barrier Discharge II.
T. Suzuki, H. Murakami, M. A. Jani, K. Takaki, S. Katoh, T. Fujiwara (Iwate University), S. Maekawa (Hitachi Eng'g. Service Corp.)

DEI-97-55 Estimation of Electron Collision Cross Section by Genetic Algorithm.
T. Miura, M. Suzuki, T. Taniguchi (Akita University)

DEI-97-56 Flashover Characteristics of Insulators under Rapid Pollution Conditions.
A. Nakajima, M. Sato, T. Komukai (Akita University), T. Oyamada (Tohoku Electric Power Co.)

DEI-97-57 Relation between Oxidation Ability of Various Ions and Growth of Water Trees.
F. Zong-huai, H. Miyata, I. Fujimoto, T. Niwa (Fujikura Ltd.), N. Yoshimura (Akita University)

DEI-97-58 A Consideration of the Equivalence Circuits for Water Trees in 6kV XLPE Power Cables.
T. Kumazawa (Chubu Electric Power Co., Inc.), S. Sugiyama, M. Hotta, T. Hashizume, T. Tani (Yazaki Electric Wire Co., Ltd.)

DEI-97-59 Fractal and Chaos Characteristics of Electrical Tree.
H. Uehara, T. Arai, K. Kudo (Meiji University)

DEI-97-60 Study of Space Charge Relaxation in Water-treed XLPE and the Equivalent Circuit of Water Trees.
K. Adachi, Y. Li, M. Ogishima, J. Kawai, Y. Ebinuma (Showa Electric Wire & Cable Co., Ltd.)

DEI-97-61 PD Characteristics in Void in Series with Fissure-like Interface.
Q. Liu, Y. Kai (Aichi Electric Co., Ltd.), M. Nagao, M. Kosaki (Toyohashi University of Technology)

DEI-97-62 Electrical Characteristics of Electron Beam Irradiated PEEK.
K. Shinyama, S. Fujita, M. Baba (Hachinobe Institute of Technology)

DEI-97-63 Diagnostic of Tree Propagation by Analysis of Partial Discharge at Each Phase Angle.
K. Urano, Y. Ehara, H. . Kishida, T. Ito (Musashi Institute of Technology)

DEI-97-64 Reconstruction of TSC Curves from Partial Curves by Using the Theory of the Fundamental Element.
Y. Kamitani, M. Yoshiura, S. Maeta (Osaka Institute of Technology), F. Yoshida (Osaka Institute of Technology Junior College)

DEI-97-65 Thermally Stimulated Currents in Polyaniline Thin Film.
M. Yoshiura, Y. Kamitani, S. Maeta (Osaka Institute of Technology), F. Yoshida (Osaka Institute of Technology Junior College)

DEI-97-66 TEM Analysis of Polyethylene.
T. Okamoto, M. Kanegami, N. Hozumi (CRIEPI)

DEI-97-67 The Factors of Electric Deterioration of Mica-Alumina Combined Insulation under Thermal and Electrical Stresses.
M. Kanegami, T. Ito, T. Okamoto (CRIEPI), H. Mitsui, R. Kumazawa, R. Aizawa (Toshiba Corp.)

DEI-97-68 Characteristics of Breakdown on Polyethylene Film Added with Azobenzene Compound.
H. Endo, Y. Yamano (Chiba University)

DEI-97-69 Surface Flashover through a Crack in Insulator with Back-electrode.
S. Ohnoya, Y. Yamano (Chiba University)

DEI-97-70 Electrical Breakdown of Multilayer Ceramics Capacitors and Prestress Effects.
Z. Yuangxiang, N. Yoshimura (Akita University)

Theme: Electronic Equipment Insulation
September 9, 1997, Kogakuin University

DEI-97-71 Influence of SO_2 Gas on Ion Migration of Printed Wiring Board in Cyclical Temperature-Humidity Environment.
T. Motoyama, K. Ichikawa (NIIS)

DEI-97-72 Analysis of Discharge Current in Surface Dielectric Breakdown of Contaminated Printed Wiring Board under Decreased Pressure.
B. Du, S. Kobayashi (Niigata College of Technology)

DEI-97-73 Analysis of Ionic Migration on Insulation Boards.
T. Yanagisawa (Electrotechnical Laboratory)

DEI-97-74 Study of Ionic-migration of Hole-to-Hole in Printed Circuit Boards.
K. Shutoh (Science University of Tokyo)

DEI-97-75 Evaluation Method of Migration by Water Drop Test Method for Printed Wiring Boards.
T. Tsukui, K. Fuwa, Y. Naitou (Tokai University), Y. Yokosuka (Hitachi Chemical Co., Ltd.)

DEI-97-76 Dielectric Property Study of Copper Ionic Migration at Insulation Layer on Metal Base PWB.
K. Okamoto, T. Maeda, K. Haga (Fuji Electric Corporate Research and Development)

DEI-97-77 Relationship between Copper Migration and Impurity in Flexible Printed Circuits.
M. Kubata, T. Uemiya, S. Takano (Sumitomo Electric Industries, Ltd.)

DEI-97-78 Growth Process of Silver Dendrite by Ionic Migration on Glass Substrate.
S. Fujiki, K. Tanino (Toyama Industrial Technology Center), C. Tatsuyama (Toyama University)

Theme: Organic Ultra-thin Films, Organic Materials in general
October 31, 1997, IEEJ Tokyo

DEI-97-79 Light Scattering of Ferro-electric Liquid Crystal.
H. Moritake, S. Kinoda, K. Toda (National Defense Academy)

DEI-97-80 Determination of Piezo-electric Coefficient of Monolayers on a Water Surface by the Maxwell-Displacement-Current Measurement.
Y. Sato, C. Wu, Y. Majima, M. Iwamoto (Tokyo Institute of Technology)

DEI-97-81 Effects of the Introduction of Buffer Layer between ITO Anode and Hole Transporting Layer on Unstable Low Current Region for Organic Light-Emitting Diode.
T. Mori, K. Imaizumi, T. Mizutani (Nagoya University)

DEI-97-82 Physical Properties of Phenylenethiophene Derivative Conducting Polymer.
M. Onoda (Himeji Institute of Technology), K. Tada, K. Yoshino (Osaka University)

DEI-97-83 Evaluation of Metal Thin Films and LB Ultra-thin Films Utilizing Surface Plasmon Excited in the Interfaces.
Y. Aoki, T. Ebe, K. Kato, K. Shinbo, F. Kaneko (Niigata University), T. Wakamatsu (Ibaraki National College of Technology)

DEI-97-84 Deposition Polymerization of a Triphenylamine Derivative.
A. Kosaka, K. Tanaka, H. Sato, H. Usui (Tokyo University of Agriculture & Technology), M. Tamada, H. Koshikawa, T. Suwa (JAERI)

DEI-97-85 Fabrication of Molecular Ultra-thin Films by Spin Coating and Evaluation of Electrochemical Properties.
J. Sasaki, M. Iizuka, S. Kuniyoshi, K. Kudo, K. Tanaka (Chiba University)

Theme: Study of Insulation Material Degradation and others
October 27, 1997, IEEJ Tokyo

DEI-97-86 Characteristics of Treeing Phonomena from Simulated Several Projections.

S. Ando, Y. Ehara, T. Hayami, T. Ito (Musashi Institute of Technology)

DEI-97-87 Suppression of Discharges in High-Voltage Rotating Machines.
K. Segawa, K. Okano (Toshiba Corporation)

DEI-97-88 Possibility of Material Diagnosis in Turbine Generators Employing Gas Analysis Method.
T. Sorita, S. Minami, H. Adachi (Mitsubishi Electric Corp.), M. Takashima, S. Numata (Kansai Electric Power Co., Inc.)

DEI-97-89 Diagnosis Methods of Electrical Power Cable installed in a Nuclear Power Station and Some Problems.
S. Yamanaka, H. Kawamura (Meijo University), K. Ito (Showa Electric Wire & Cable Co., Ltd.), T. Seguchi (JAERI)

DEI-97-90 Fundamental Study on Insulation Diagnosis in Locally Degraded XLPE Cables.
M. Ogishima, Y. Li, K. Adachi, T. Sumimoto, J. Kawai, J. Shinagawa (Showa Electric Wire & Cable Co., Ltd.)

DEI-97-91 Study on the Current Detection Mechanism of Various Insulation Diagnosis for Power Cables.
M. Kakuta (Mitsubishi Cable Industries)

DEI-97-92 The Relationship Between Higher Harmonic Components and Deterioration Signals Obtained by AC Superposition Method.
T. Kumazawa (Chubu Electric Power Co., Inc.), M. Hotta, S. Sugiyama, T. Hashizume, T. Tani (Yazaki Electric Wire Co., Ltd.)

DEI-97-93 Study on the Diagnosis of Insulation Deterioration of XLPE Cable by Means of Low-frequency Loss Current Measurement.
H. Kamohara, Y. Kudo, I. Shinohara, A. Ito (Daiden Co., Ltd.)

DEI-97-94 Development of Diagnostic Device for Incoming Electric Power Equipment in Service.
O. Iwaya, T. Sugiyama, N. Ubukata (Kanto Electrical Safety Inspection Assoc.), S. Kataoka, K. Kotani, K. Soma (Hitachi Cable, Ltd.)

DEI-97-95 Management of High-Voltage Cables and Prediction of Their Deterioration.
K. Etoh (Idemitsu Petrochemical Co., Ltd.)

DEI-97-96 The Significance and Problem of Insulation Diagnostic Method in Toyota.
W. Okamoto (Toyota Motor Corporation)

Theme: Space Charges and High Electric Field Phenomena
November 18, 1997, IEEJ Kansai Branch

DEI-97-97 Analysis on Conduction Current by Simultaneous Measurement of TSC and Space Charge Distribution.
M. Kodaka, K. Mamiya, Y. Tanaka, T. Takada (Musashi Institute of Technology)

DEI-97-98 Influence of Additives to the Electrical Properties of a New Type Polyethylene.
S. Wang, M. Yamaguchi, M. Fujita, H. Shintate, M. Okashita, T. Shiono, J. Shinagawa (Showa Electric Wire & Cable Co., Ltd.)

DEI-97-99 Generation of Pressure Wave Pulse in XLPE Cable.
Y. Li, K. Adachi, J. Shinagawa (Showa Electric Wire & Cable Co., Ltd.), T. Nakagawa (Kansai Electric Power Co., Inc.)

DEI-97-100 Dielectric Properties of a New-type Polyethylene Polymerized Using a Single-site Catalyst.
H. Yoneda, M. Araoka, Y. Ohki (Waseda University)

DEI-97-101 Formation and Annihilation Characteristics of Space Charge at the Interface between Two Different Dielectric Materials.
T. Oishi, M. Uchiumi, K. Ueda (Kyushu University), T. Yanaka (CRIEPI)

DEI-97-102 Calibration Technique of the Charge Density on Space Charge Measurement.
T. Maeno (Communications Research Laboratory)

DEI-97-103 Space Charge Observation in an Insulation Layer of a Metal Base Printed Wiring Board.
K. Fukunaga, T. Maeno (Communications Research Laboratory), K. Okamoto, K. Haga (Fuji Electric Corporate Research and Development, Ltd.)

DEI-97-104 Internal Space Charge Observation in Epoxy Resin Absorbed by Various Temperatures.

T. Iizuka, T. Hosoya, H. Takai (Tokyo Denki University), K. Fukunaga, T. Maeno (Communications Research Laboratory)

DEI-97-105 Measurements of Space Charge Formation on Mold Type Sphere-Plane Electrode System in Polymer Film.
M. Fukuma (Matsue National College of Technology), M. Nagao, M. Kosaki (Toyohashi University of Technology), Y. Kohno (Five Lab. Ltd.)

DEI-97-106 Measurement Result of Space Charge in XLPE Cables Part. 6.
T. Nakagawa, M. Yoshimoto (Kansai Electric Power Co., Inc.)

DEI-97-107 Effect of Oxidation on Electrical Breakdown of Low Density Polyethylene Film and Formation of Space Charge.
A. Kuzumaki, S. Mitsumoto, M. Nagao, M. Kosaki (Toyohashi University of Technology)

DEI-97-108 Effect of Acetophenone on Electric Breakdown and Space Charge Formation in Polyethylene Film.
S. Mitsumoto, K. Tanaka, M. Nagao, M. Kosaki (Toyohashi University of Technology), M. Fukuma (Matsue National College of Technology)

DEI-97-109 An Analysis of Polymeric Insulating Materials Degraded by Partial Discharges Using Atomic Force Microscope and FTIR.
T. Sugai, Y. Sekii (Chiba Institute of Technology)

DEI-97-110 Effect of Semi-conductive Layer on Space Charge Formation in Polyethylene.
A. Yokoyama, H. Miyata, T. Takahashi (Fujikura Ltd.)

DEI-97-111 Development of High Thermal Conductive Material for Extremely Low Temperature (2).
S. Nagaya (Chubu Electric Power Co., Inc.), H. Miyata, A. Ono (Fujikura Ltd.)

DEI-97-112 Observation of DC Prebreakdown Phenomena in Dielectrics for Nanosecond Duration Using the Long Image Guide Scope.
K. Kadowaki, S. Arikawa, S. Nishimoto, I. Kitani (Ehime University)

DEI-97-113 Multifractal and Local Fractal Dimension Distribution of Electrical Tree.
M. Fujii, S. Kubota, T. Saito, H. Ihori, K. Arii (Ehime University)

DEI-97-114 Deterioration Diagnosis of Insulating Oil for Middle-sized Power Transformers by Optical Analysis.
J. Katagiri, Y. Takezawa, Y. Itoh (Hitachi, Ltd.), K. Sawada, H. Fudoh, T. Genji (Kansai Electric Power Co., Inc.)

DEI-97-115 Nature of Water Trees Analyzed by Space Charge Distribution.
Y. Ohki (Waseda Univ.), Y. Ebinuma (Showa Electric Wire & Cable Co., Ltd.), S. Katakai (Hitachi Cable)

DEI-97-116 Characteristics of Partial Discharge in an Artificially-Simulated Tree Channel.
H. Kaneiwa, Y. Suzuoki, T. Mizutani (Nagoya University)

DEI-97-117 Effects of Filler Shape on Dielectric Properties in Filled Epoxy Resin.
M. Ezoe, M. Tada, M. Nakanishi (Nitto Denko Corporation)

DEI-97-119 Study of Recyclable Cables.
Y. Kobayashi, Y. Higashikawa, T. Kabe, N. Yamasaki, M. Nakasuji, T. Hiura (Sumitomo Electric Industries, Ltd.)

DEI-97-120 Estimation of Degradation Progress of Low Density Polyethylene Suffering Partial Discharge Using Phase Resolved Partial Discharge Occurrence Pattern on Model Electrode System.
F. Komori (Toba National College), A. Kojima, Y. Suzuoki, T. Mizutani (Nagoya University), M. Hikita (Kyushu Institute of Technology)

DEI-97-121 Deterioration Mechanisms of Silicone Rubber Used for Polymer Insulators by Corona Discharge.
Y. Koshino, I. Umeda, M. Ishiwari (NGK Insulators, Ltd.)

DEI-97-122 Characteristics of Charging on a Epoxy Spacer Under DC Voltage
Y. Yoshida (Kansai Electric Power Co., Inc.), Y. Nakakoshi (Shikoku Electric Power Co., Inc.), M. Hatano (Electric Power Development Co., Ltd.), T. Rokunohe, F. Endou (Hitachi, Ltd.)

DEI-97-123 Negative-Resistance Characteristics of Organic-Dye-Doped Thin-Polymer-Film Device.

A. Kawamoto (Fukui National College of Technology), Y. Suzuoki, T. Mizutani (Nagoya University)

DEI-97-124 Development of Insulation System for High Voltage Rotating Machinery of Low Environmental Load.
N. Iwata, H. Hatano (Toshiba Corporation)

DEI-97-125 Effect of Internal Thermal Oxidation Treatment on the Dielectric Strength of Buried Oxide Formed by the Separation-by-Implanted-Oxygen (SIMOX) Process.
H. Koike, K. S. Seoi, T. Futami, Y. Ohki (Waseda University)

DEI-97-126 Junction States of Conducting Polymer thin Film/Metal Interface.
D. Fujita, M. Onoda, H. Nakayama (Himeji Institute of Technology)

DEI-97-127 Electroluminescence from Surface Layer of Insulating Polymer under AC Voltage Application.
T. Mizuno, Y. S. Liu, W. Shionoya, S. Matsushima, K. Yasuoka, S. Ishii (Tokyo Institute of Technology), A. Yokoyama, H. Miyata (Fujikura Ltd.)

DEI-97-129 Electrical Conduction and Fractal Structure of Carbon-Black Filled EEA.
M. Nakamura, D. Nakagawa, T. Arai, H. Uehara, K. Kudo (Meiji University)

DEI-97-130 Electrical Conduction Mechanism and Dielectric Properties of Carbon Black-Polyethylene Composites.
S. Nakamura, K. Saito, G. Sawa (Mie University), K. Kitagawa (Gifu National College of Technology)

DEI-97-132 Research Activities on Multistress Ageing.
K. Kimura (Mitsubishi Electric Corporation)

DEI-97-133 Development of New Insulation Systems for Motors Considering Durability and Productivity.
H. Mitsui, T. Tajima (Toshiba Corporation), T. Atsuchi (Nishishiba Electric Co., Ltd.), K. Shimohira (Showa Electric Wire & Cable Co., Ltd.)

DEI-97-134 Application of Metallized Film for DC High-Voltage Capacitors.
K. Suganuma, T. Muraoka (Nissin Electric Co., Ltd.), K. Unami, N. Suzuki (Toyama Matsushita Electric Co., Ltd.)

DEI-97-135 Influence of Inverter Surge on Low Voltage Rotating Machine Insulation.
K. Hata, Y. Okuyama (Fuji Electric Corporate Research and Development, Ltd.)

DEI-97-136 Long Term Insulation Characteristics of XLPE Cable upon Application of Harmonic-superimposed Voltage.
Y. Nakamichi, H. Shigeeda, K. Ajiki (Railway Technical Research Institute), S. Ikeuchi, J. Shinagawa (Showa Electric Wire & Cable Co., Ltd.)

DEI-97-137 Simulation of Interturn Voltage in Transformer Windings Excited by Very Fast Transient Overvoltages.
T. Horiguchi, H. Kurita, T. Kikunaga, K. Nakanishi, Y. Shibuya (Mitsubishi Electric Corp.)

Theme: Functional Organic Films in general
November 21, 1997, Niigata University

DEI-97-139 Evaluation of Tilt Angles of Liquid Crystal Molecules on Polyimide LB Films Using the Attenuated Total Reflection Measurement.
A. Baba, F. Kaneko, K. Shinbo, K. Kato, S. Kobayashi (Niigata University), T. Wakamatsu (Ibaraki National College of Technology)

DEI-97-140 Negative Photoelectric Effect and Structural Characterization of Adsorption LB Films.
K. Kudo, S. Kuniyoshi, K. Tanaka (Chiba University)

DEI-97-141 Preparation and Electrical Properties of Tetra-Carboxy Vanadyl Phthalocyanine LB Films.
A. Fukui, H. Furuhashi, T. Yoshikawa, A. Maeda, S. Ochiai, Y. Uchida, K. Kojima, A. Ohashi, M. Ieda (Aichi Institute of Technology)

DEI-97-142 Determination of Interfacial Electronic States of Phthalocyanine Derivative LB Films by Surface Potential Measurement.
H. Kokubo, Y. Oyama, Y. Majima, M. Iwamoto (Tokyo Institute of Technology)

DEI-97-143 Synthesis of C_{60} Compound Polymer from Solution.

H. Endo, Y. Nagayama, T. Watanabe, H. Yamamoto (Nihon University)

DEI-97-144 Electronic Devices Using Ultrathin Films of Conducting Polymers.
M. Onoda, H. Nakayama (Himeji Institute of Technology), K. Tada, K. Yoshino (Osaka University)

DEI-97-145 Electrical Properties of Carbon Black Resin Composite Films Made by the Electrostatic Coating Method.
R. Watanabe, H. Ono (Suzuka Fuji Xerox Co., Ltd.), S. Nakamura, A. Ito, G. Sawa (Mie University)

DEI-97-146 Negative-Resistance Characteristics of Organic-Dye-Doped Thin-Polymer-Film.
A. Kawamoto (Fukui National College of Technology), Y. Suzuoki, T. Mizutani (Nagoya University)

Theme: Equipment Analysis / Radiant Rays Irradiation Effects
December 9, 1997, Waseda University

DEI-97-147 Charge Behavior Observation and Its Analysis in Gamma-Irradiated LDPE.
Y. Tanaka, T. Takada (Musashi Institute of Technology), J. M. Alison (King's College London)

DEI-97-148 Study of Change of Chemical Structure & Surface Topology in Polyethylene Irradiated by C & Arion-Beams under Air and Vacuum.
K. Inoue, M. Kitoh, T. Oka, A. Samura, Y. Hama (Waseda University), F. Yatagai (RIKEN)

DEI-97-149 Irradiation Effects of Polyethylene Produced by Single-site Catalyst.
A. Ogata, M. Nitta, T. Tani (Yazaki Electric Wire Co., Ltd.), T. Yagi, Y. Morita (JAERI)

DEI-97-150 Influence of Irradiation Atmosphere on the Polymer Reaction with Electron Beam Irradiation.
M. Hakoda, S. Mukai, K. Nakai (Nissin-High Voltage Co., Ltd.)

DEI-97-151 Electrical and Mechanical Properties of Coaxial Cables for Use under High Temperature and Radiation Condition (4).
H. Mitsui, H. Karasawa, N. Sasaki (Toshiba Corp.), O. Shimizu, S. Ono, K. Oosada (Showa Electric Wire & Cable Co., Ltd.)

DEI-97-152 Radiation Resistant Test on Thermal Control Material Used in Space.
H. Kudoh, M. Sugimoto, T. Seguchi (JAERI), M. Tagashira, K. Imagawa (NASDA), M. Nakai (Matsushita Techno-Research Co., Ltd.)

DEI-97-153 Effect of Ion Implantation on the Photoluminescence in Hydrogenated Amorphous Silicon Nitride Films.
T. Futami, K. S. Seol, T. Watanabe, H. Tseng, M. Ishii, Y. Ohki (Waseda University), M. Takiyama (Nippon Steel Co.)

DEI-97-154 Characterization of Paramagnetic Centers Induced by Ultraviolet Photons in Ge-doped SiO_2 glass.
T. Katoh, M. Fujimaki, T. Kasahara, N. Miyazaki, Y. Ohki (Waseda University)

DEI-97-155 Green Photoluminescence Band in Oxygen Surplus Silica Glass.
Y. Sakurai, K. Nagasawa (Shonan Institute of Technology), H. Nishikawa (Tokyo Metropolitan University), Y. Ohki, Y. Hama (Waseda University)

Theme: High Temperature Electrical Insulation
January 21, 1998, Japan Travel Society

DEI-98-1 Self-Healing Breakdown of Polyimide Thin Films in High Temperature Region.
Y. Muramoto, F. Mizuno, M. Nagao, M. Kosaki (Toyohashi University of Technology)

DEI-98-2 Effects of Fluorine Doping on the Dielectric Strength in SiO_2 Films Formed by Plasma-Enhanced Chemical Vapor Deposition.
A. Takami, H. Kato, S. Sakai, Y. Ohki (Waseda University), K. Ishii (National Defense Academy)

DEI-98-3 Silicone Chains as a Heat Resistive Coupling Agent.

K. Iida, H. Yamaura, S. Nakamura, G. Sawa (Mie University)

DEI-98-4 Partial Discharge Characteristics on Polymer Insulating Materials at Elevated Temperature.
T. Okamoto, M. Kanegami (CRIEPI)

DEI-98-5 Variety of Kapton New Polymide Films.
H. Yokoyama (Dupont-Toray Co., Ltd.)

DEI-98-6 Effects of Pore and Impurities on Electrical Properties of Alumina Ceramics.
K. Horinouchi, O. Yamanishi, H. Takahashi (Sumitomo Chemical Co., Ltd.)

DEI-98-7 Development of New Insulation System for Traction Motor Stator Windings.
Y. Haraguchi, S. Maruyama, T. Honda (Hitachi Works, Hitachi, Ltd.), S. Amagi, K. Fukushi, K. Sugawara (Hitachi Research Laboratory, Hitachi, Ltd.)

DEI-98-8 Electrical Ageing Test of Enameled Wire Using Surge Voltage.
M. Tsuchiya, H. Yamakawa (Toyo Denki Seizo K.K.), I. Amasaki, T. Sunose (Chiba Institute of Technology)

Theme: Cryogenic Liquids, Low Pressure Discharge, Electric Optical Effects, Plasma Process, others
January 30, 1998, Nagasaki University

DEI-98-9 Change of Partial Discharge Mode with Stressing Time in Closed Void at Liquid-Nitrogen Temperature,
M. Nakamura, T. Mine, S. Tsuru, J. Suehiro, M. Hara (Kyushu University)

DEI-98-10 Bubble Behavior and Its Effect on Partial Discharge in Superconducting Fault Current Limiter,
N. Tamuro, B. Y. Seok, M. Hara (Kyushu University)

DEI-98-11 Surface Processing of Polymers Using High E/n Discharge (III).
N. Hamamura, M. Yumoto, T. Sakai (Musashi Institute of Technology)

DEI-98-12 Restricted Plane Discharge Phenomena at Low Pressure.
Y. Kikuchi, M. Endo (Chuo University)

DEI-98-13 Detection of Oxygen Negative Ions and Negatively-Charged Particulates in a DC Oxygen Glow Discharge.
Y. Matsuda, H. Nagamatsu, H. Fujiyama (Nagasaki University)

DEI-98-14 Diagnostics of Spatial Structure of Magnetron Plasmas with Multi-electrodes by a Superposition Method.
K. Kuwahara, H. Fujiyama (Nagasaki University)

DEI-98-15 Investigation of Plasma Using Microwave Interferometry with Dielectrics Lens.
T. Narikiyo, T. Ikegami, Y. Yamagata, K. Ebihara (Kumamoto University)

DEI-98-16 Micro-Discharge Plasma Characteristics of High-Frequency Silent Discharges.
Y. Kumagae, N. Morii, Y. Yamagata, T. Ikegami, K. Ebihara (Kumamoto University), Y. Kataoka (Meidensha Corporation)

DEI-98-17 Measurement of Potential, Electric Field and Developing Velocity of Surface Discharge by Using Pockels Device.
A. Kumada, M. Chiba, K. Hidaka (University of Tokyo)

DEI-98-18 Measurement of Potential Distribution of Attached Charge by BSO.
S. Tashiro, M. Endo (Chuo University)

DEI-98-19 Fundamental Characteristics of a Non-Uniform Traveling Wave Type Electric Field in Dielectric Liquid Using the Schlieren Method.
T. Oda, M. Aoyama, M. Kawasaki (Nishinippon Institute of Technology), H. Kudo, S. Kanazawa, T. Ohkubo, Y. Nomoto (Oita University)

DEI-98-20 Investigation of Current Distribution and Quench Mechanism in Parallel Connection of Mechanical PCSs.
T. Nakamura, S. Ohtsuka, D. Tsuji, J. Suehiro, M. Hara (Kyushu University)

Theme: Reports on International Conferences and Inverter Surge Insulation, others
February 24, 1998, IEEJ Tokyo

DEI-98-21 A Report on the International Conference on Dielectrics and Insulation (I. C. D. I).
Y. Tanaka (Musashi Institute of Technology)

DEI-98-22 Dielectric Society Meeting Report.
T. Takada (Musashi Institute of Technology)

DEI-98-23 Report on the 1997 Conference on Electrical Insulation and Dielectric Phenomena (CEIDP).
Y. Ohki (Waseda University)

DEI-98-24 Report on the 5th International Conference on Properties and Applications of Dielectric Materials (ICPADM '97).
T. Tokoro (Gifu National College of Technology)

DEI-98-25 Report on 10th International Symposium on High Voltage Engineering.
S. Yamanaka (Meijo University), Y. Mizuno (Nagoya Institute of Technology), T. Yamashita (Nagasaki University)

DEI-98-26 Report of 1997 CIGRE SC15 (Materials for Electrotechnology) Massachusetts Meeting.
M. Nagao (Toyohashi University of Technology), T. Tanaka (CRIEPI), K. Goto (Toshiba)

DEI-98-27 Activity of the Investigation Committee of Inverter Surge Insulation.
K. Kimura (Mitsubishi Electric Corporation)

DEI-98-28 Characteristics of Impulse Interfacial-Discharge Occurring at the Interface between two Dielectrics and Measurement of Charge Produced by its Discharge.
Y. Gosho, M. Endo, Y. Sekiguchi, N. Murakami (Chuo University)

DEI-98-29 Voltage Endurance Characteristics of Rotating Machine Coil Insulation by PWM Inverter-like Voltage.
K. Mori, Y. Inoue (Toshiba Corporation)

DEI-98-30 Analysis of Surge Voltage due to PWM Inverters.
H. Fujii (Fuji Electric Co., Ltd.), K. Haga, Y. Okuyama (Fuji Electric Corporate Research and Development)

DEI-98-31 Some Hints on the Insulation Design of XLPE Cables for Inverter Surges Based on Experimental Results.
Y. Ohki (Waseda University)

DEI-98-32 Prospects of Research and Development in the Field of Dielectrics and Electrical Insulation Techniques Towards the 21st Century.
H. Mitsui (Toshiba Corporation)

Theme: Treeing / Discharges in general
July 28, 1998, Nagoya University

DEI-98-33 Time-resolved Space Charge Observation in Water-treed XLPE.
S. Mukai, Y. Ohki (Waseda University), Y. Li (Showa Electric Wire & Cable Co., Ltd.), T. Maeno (Communications Research Laboratory)

DEI-98-34 Distorted Current in Water Tree Cross-Linked Polyethylene.
J. Kawai, Y. Li, M. Ogishima, J. Shinagawa, Y. Ebinuma (Showa Electric Wire & Cable Co., Ltd.), S. Nakamura, G. Sawa (Mie University)

DEI-98-35 A New Non-destructive Measurement Method for Conductivity and Permittivity of Water-treed Samples by Different Frequency Measurement.
Y. Li, M. Ogishima, T. Sumimoto, J. Kawai, J. Shinagawa (Showa Electric Wire & Cable Co., Ltd.)

DEI-98-36 Analysis of Luminescence in Tree from Simulated Several Projections.
T. Iwata, Y. Ehara, T. Hayami, T. Ito (Musashi Institute of Technology)

DEI-98-37 Diagnosis of Treeing Deterioration by Analysis of Discharge and Discharge Luminous Location at Each Phase Angle Area.
K. Osawa, Y. Ehara, T. Ito, T. Hayami (Musashi Institute of Technology)

DEI-98-38 Study on Tree Propagation and Partial Discharge using Artificially-Simulated Tree Channel.
H. Kaneiwa, K. Shizu, Y. Suzuoki, T. Mizutani (Nagoya University)

DEI-98-40 Effect of Liquid Impregnation on Electrical Treeing.
M. Izumitani, N. Shimizu (Nagoya University)

DEI-98-41 Influence of Impurities on Growth of Water-tree in Polyethylene.

H. Shintate, M. Tanimoto, S. Wang, M. Okashita, T. Shiono (Showa Electric Wire & Cable Co., Ltd.)

DEI-98-42 Nonlinear Characteristics of AC Electrical Tree Length and its 3-D Fractal Analysis.
H. Uehara, K. Kudo (Meiji University)

DEI-98-43 Electric Breakdown and Partial Discharge Characteristics in Simulated-Tree-Narrow-Tube.
M. Nagao, Y. Muramoto, M. Iuchi (Toyohashi University of Technology), M. Kosaki (Gifu National College of Technology)

By Dr. Y. Ebinuma (Showa Electric Wire & Cable Co., Ltd.)

IEEJ Technical Reports Edited by TC-DEI and Related TCs

Technical reports listed here are made by investigation committees in the technical committee on DEI and related investigation committees since the publication of EINA No. 4 (1997). They are described in Japanese.

No. 645 : "Technical Standard and Accreditation System for High Voltage Measurement", by Investigation Committee on Technical Standard for High Voltage Measurement, (B), p.120, ¥ 3,800, August 1997.

No. 654 : "History of Electrical Engineering Education in Japan", by Investigation Committee on History of Electrical Engineering Education, (A), p.82, ¥ 3,000, October 1997.

No. 664 : "Research and Development Trend on Application of LTS and HTS Superconduction", by Investigation Committee on Superconduction Applied Apparatus and Properties of Conductors, (B), p.130, ¥ 4,500, January 1998.

No. 668 : "Insulation Deterioration of High Voltage XLPE Cable and Trend of the Insulation Diagnostic Techniques", by Investigation Committee on Insulation Diagnostic Techniques for High Voltage XLPE Cables, (B), p.162, ¥ 4,900, February 1998.

No. 670 : "Lightning Observation Techniques Needed for Countermeasure for Lightning Accident Prevention", by Investigation Committee on Lightning Observation Techniques, (B), p.100, ¥ 4,400, February 1998.

No. 674 : "Fundamental Process of Treeing Deterioration in Polymer Insulating Materials", by Investigation Committee on Fundamental Process of Treeing Deterioration, (A), p.70, ¥ 3,500, April 1998.

No. 678 : "Lightning Impulse Response in Electric Distribution Lines", by Investigation Committee on Lightning Impulse Response in Electric Distribution Lines, (B), p.66, ¥ 3,900, May 1998.

No. 679 : "Reacted Particles and the Energy in Discharge Plasma Science", by Investigation Committee on Reacted Particles and the Energy in Discharge Plasma Science, (A), p.64, ¥ 3,200, May 1998.

N. B. : ( ) after the name of Investigation Committee means a Society :

A : Fundamentals and Materials, in which the TC-DEI is included
B : Power and Energy
C : Electronics, Information and System
D : Industry Applications
E : Sensors

¥ : Japanese Yen

TECHNICAL EXCHANGES BETWEEN ASIAN COUNTRIES

Conference Records

1997Japan-Korea Joint Symposium on Electrical Discharge and High Voltage Engineering (1997 J-K Symposium on ED & HVE)

1997 J-K Symposium on ED & HVE was held on 13-14 October 1997 at the Venture Business Laboratory of Kyushu University, Fukuoka, Japan. It was organized by the Technical Committee on Electrical Discharge of IEEJ and the Venture Business Laboratory of Kyushu University, Japan and co-organized by the Electrical Discharge and High Voltage Society of KIEE.

The 1997 J-K Symposium on ED & HVE was planned to offer the opportunities for scientists and engineers to present and to discuss the latest progress in the field of electrical discharge and high voltage engineering.

The four papers were invited and 58 camera-ready papers from two countries were accepted from 75 abstracts submitted to the program committee and aligned in seven oral sessions and one poster session covering the topics of High Voltage Testing and Measuring Techniques, Partial Discharges and Diagnostic Techniques, Electrical Breakdown in Vacuum, Gases, Liquids and Solids, Electrical Discharges and Their Applications, Electric Fields and Their Applications, Electrical Insulation and Lightning.

All accepted papers were published in the proceedings of 1997 Japan-Korea Joint Symposium on Electrical Discharge and High Voltage Engineering. Total of participants were 108 from 4 countries: 62 from Japan, 44 from Korea, 1 from China and 1 from Philippine.

In addition to the regular technical sessions, a post conference tour was planned. Participants were visiting Research Laboratory and Fukuoka Customer Service Office of Kyushu Electric Co. Ltd, Fukuoka Energy Service Station, Fukuoka Dome and Canal City Hakata and enjoyed Tea Time at Hakata downtown

The next symposium will be held in Pusan, Korea, on early October 1998.

by Prof. Masanori Hara (Kyushu University)

Announcement of International Conference to be Held in Asia

'98 International Symposium on Electr. Insul. Materi. ('98 ISEIM)

('98 AICDEI & 30th SEIM) September 27-30, 1998, Toyohashi, Japan

'98 International Symposium on Electrical Insulating Materials will held on September 27-30, 1998, jointly with 1998 Asian International Conference on Dielectrics & Electrical Insulation and 30th Symposium on Electrical Insulating Materials at Holiday inn Crown Plaza Toyohashi, Toyohashi, Japan. This symposium will be cosponsored by the IEEE Dielectrics and Electrical Insulation Society (DEIS), the Institute of Electrical Engineers of Japan (IEEJ), Chinese Electrotechnical Society (CES) and the Korean Institute of Electrical Engineers (KIEE).

Main subjects are: 1. Electrical Conduction and Breakdown in Dielectrics, 2. Space Charge, Surface and Interfacial Phenomena, 3. Electrical Insulation for Apparatuses and Cables, 4. Electrical Treeing and Water Treeing, 5. PD Measurement, Diagnostics, Monitoring and Expert Systems, 6. Testing and Measuring Techniques, 7. New Materials, New Technologies, Data Base for Electrical Insulation, 8. Dielectric Phenomena and Their Applications, 9. Dielectric Materials for Electronics.

Submission of papers: an abstract of not more than 200 words to the symposium secretariat by February 20, 1998. Acceptance or rejection notices will be mailed by mid April, 1998. Camera ready manuscripts should be submitted by June 30, 1998.

For further information, please contact the symposium secretariat:

Dr. Masayuki Nagao
Department of Electrical and Electronic Engineering,
Toyohashi University of Technology
1-1 Higarigaoka, Tempaku, Toyohashi 441, Japan
Tel : +81-532-44-6725, Fax: +81-532-48-7634, E-mail: nagao@eee. tut. ac. jp
Internet WWW Site: http://boss. eee. tut. ac. jp/98iseim/index. html

The 9th &10th Asian Conference on Electrical Discharge (ACED)

The 9th and 10th ACED's will be held in 1998 in Indonesia, Chairman of Prof. K. T. Sirait and in 2000 at Kyoto, Japan, Chairman of Prof. T. Takuma (Kyoto University), respectively.

/////////////9th Call for Papers/////////////

9th ACED will be held in Bundung, Indonesia, on 9-11 November 1998. Topics are 1)Discharges in Gases, 2)Discharges in Liquids and Solids, 3)Discgarges in Interfaces, 4)Plasma and Applications, 5)Electrostatic Precipitators, 6)Lightning Discharges and Overvoltage Protection, 7)High Voltage Equipments and Test Techniques, 8)Environmental Effects on Biological System, and 9)Environmental Effects on Electrical Apparatus.

Dead Line:

Submission of Abstruct: July 11, 1998
Notification of Acceptance: July 31, 1998
Camera-ready papers: September 30, 1998

ACED-98 Secretariat:

Dr. Suwarno
Department of Electrical Engineering
Bandung Institute of Technology
Jl. Ganesha 10 Bandung 40132 Indonesia
TEL: +62-22-250-0995
FAX: +62-22-250-4486
E-mail: suwarno@melsa. net. id

13th International Conference in Dielectric Liquids (ICDL '99)

July 20-25, 1999, Nara, Japan

13th International Conference in Dielectric Liquids will be held on July 20-25, 1999, at Nara-ken New Public Hall, Nara, Japan. The Conference is an interdisciplinary forum for the exchange and discussion of ideas, research results and practical experiences on properties, dielectric phenomena and applications on insulating liquids. It is addressed to physicists, chemists, material scientists and engineers who are engaged in research and practical application in these fields. The main topics of the Conference are;

Basic properties: Properties of charge carriers, Electrical conduction, Electronic states in liquids, Dielectric properties of liquids and solutions, Radiation in liquids, Fundamental processes, Space charge effects, High fields effects, Optical properties, Kerr effect, etc.

Prebreakdown and breakdown phenomena: Prebreakdown and breakdown processes, Streamers in liquids, Streameing electrification, Creepage discharges, EHD, Interfacial phenomena, etc.

Advanced experimental methods: Novel detection and measurement techniques, New sensors, detectors and other equipment

Applications: High voltage liquid immersed insulation, Power apparatus insulation for transformers, cables, capacitors, etc., Electrostriction pump, Cryogenic liquids, Electrorheology, etc.

Others: Ultrasonic, Molten polymers, Liquid crystals, Supercritical fluids, New materials, etc.

Submission of extended abstracts: October 30, 1998
Notification of acceptance: December 15, 1998
Submission of full manuscript: February 28, 1999

Chairperson: Prof. Katsumi Yoshino (Osaka University)
Vice Chairperson: Prof. Hisanao Yamashita (Keio University)
Secretary General: Prof. Hitoshi Okubo (Nagoya University)
e-mail: icdl@ele.eng.osaka-u.ac.jp
URL: http://www.ele.eng.osaka-u.ac.jp/icdl/

The Asian Conference on Electrical Insulation Diagnosis

The origin of the conference was the China-Japan conference on Electrical Insulation Diagnosis which started in April, 1990. Since then, the conferences were held every two years; 1990 in Xi'an, 1992 in Shanghai, 1994 in Osaka and 1996 again in Xi'an. It intends to be a forum of electrical insulation diagnosis for promotion and exchange of ideas, experience and technology, and to stimulate advanced scholarly work, research and industrial activities on insulation diagnosis for electric power apparatus. For encouraging to discuss and exchange experience, a lot of technical visit are arranged with the conference. It is helpful for stimulating the research of new technique and the propagation of the advanced technology.

On the Joint Conferences of 1994 and 1996, many attendants from other countries were interested to these activities, they sincerely hope to enlarge the China-Japan Conference on Electrical Insulation Diagnosis into all over the Asia or Pacific countries. As the first step, the organizers of the past conferences, Professors Z. Yan of Xi'an Jiaotong University and K. Matsuura of Osaka University suggest it will be held under the new name 'The Asian Conference on Electrical Insulation Diagnosis' in 1999 in Korea where many researchers and engineers are involved in the R&D of electrical insulation diagnostic technology for power apparatus. For the time being, however, the detail plan of 1999 Conference is not decided yet.

The 6th ICPADM

The 6th ICPADM will be held at Xi'an Jiaotong University, Xi'an, China in 2,000.

International Confereence on Electrical Engineering(ICEE)

ICEE'99 will be held in Hong Kong and ICEE 2000 will be held in Fukuoka or Kitakyusyu , Japan.

MISCELLANEOUS

Letters from Readers

From Dr. Sushil Kumar Karmakar, Tripura Engineering College, Agartala Tripura, 799055 India.
Dated on Nov. 22, 1997

(1) Comments: Electrical Insulation News in Asia is quite informative.
(2) Suggestions:
(a) Some informative articles on Breakdown Phenomena in Solids, Liquids and Gaseous Dielectric under the influence of Intense Electric Fields and Magnetic Fields may be published in the forthcoming issue/issues.
(b) This suggestion of publishing one/more articles regarding calculation of Electrical Conductivity in the Breakdown Region in Dielectrics under the application of High Electric Field and Magnetic Fields (which is presumed to be of directional character) may be published.
For this, my suggestion may kindly be forwarded to Dr. H. Okubo/ K. Kojima, N. Hayakawa/ S. Yamasa regarding their research subject "Conduction and Breakdown Characteristic in Dielectric Liquids and Their Application to Electrical Power Apparatus", The postal address of the persons may kindly be mailed to my address. Please note that I am working in this area.
(3) Information: The names and postal address of the investigator working in the area of "Dielectric Breakdown Phenomena" may please be mailed to my address.

From Dr. Zhang Yingsou, Xi'an Insutitute of Application of Insulating Materials, 11 Tao Yuanoad 710082, Xi'an China, Dated on April 4, 1998.

I have received a letter and copies of EINA No.4 sent by you and obtained much information from them. Thank you very much.

I would like to submit the paper to the next EINA. Would you scrutinize it, Please? Some papers have been published. But, many scientists cannot recognize it. Why so? Thus, we have been studying the problem. Reasons might be as follows: ..... (omitted).

A paper titled as "Rapid Thermal Endurance Tests of Insulating Materials and Chemical Kinetics" by Zhang Yingsou and Liu Min with five pages was attached to the letter.

Form the chairman:

Thank you very much for your letter and the submission of your paper. However, to my regret, it is not possible to publish a full paper in EINA. If you send me "the Introduction of activities in Asia", it will be possible to publish the article in EINA No.6.

Prof. Hisanao Yamashita
Chairman , Cooperative Research Committee on EINA in IEEJ
Department of Electrical Engineering
Faculty of Science and Technology, Keio University
3-14-1 Hiyoshi,Kohoku-ku, Yokohama 223-8522, Japan
Fax:+81-45-563-2773

Application for Membership of IEEJ

A member of IEEJ receives a monthly journal (The Journal of The Institute of Electrical Engineers of Japan) and one transaction out of five (A: Fundamentals and Materials in which the activity of DEI is included, B: Power and Energy, C: Electronics, Information and System, D: Industry Applications, E: Sensors). The journal gives interesting readings about the latest science and technology in the field of Power Energy, Power Apparatus, Electronics, Information Engineering, Materials and so on. The transaction gives review papers, research papers, letters and other information.

Total fee for joining IEEJ as a general member is ¥ 12,400 which consists of initiation fee ¥ 1,200,

annual membership fee ¥ 10,000 and overseas postage of journal ¥ 1,200 (¥ : Japanese Yen).

When you need more information or an application form, you can request them from membership section of IEEJ.

Way for Purchasing Proceedings of IEEJ Technical Meetings and IEEJ Technical Reports

(1) Proceedings of symposium on electrical insulating materials
Please request it to the investigation section of IEEJ.

(2) Proceedings of technical meetings
You can purchase them by subscription for a year (Jan. to Dec.). Please request it to the investigation section of IEEJ.
When you need photocopies of papers presented at a technical meeting, you can order the photocopies from JICST (*).

(*) JICST : The Japan Information Center of Science and Technology
2-5-2 Nagata-cho, Chiyoda-ku, Tokyo 100, JAPAN.
Fax : +81-3-3593-3375.

(3) Technical report
You can order technical reports from the publishing section of IEEJ.

Address of IEEJ:
The Institute of Electrical Engineers of Japan
8F HOMAT HORIZON Bldg., 6-2, Goban-cho,
Chiyoda-ku, Tokyo 102, JAPAN
Tel: +81-3-3221-3703 (Administrative Sec.)
-7321 (Membership Sec.)
-7201 (Investigation Sec.)
-7275 (Publishing Sec.)
Fax: +81-3-3221-3704 (In common)
(The office of IEEJ has moved since July 1996)

Photos of Front and Rear Covers

Front cover:

This picture shows the Trans-Tokyo Bay Highway bridge and 500kV XLPE Cable. Trans-Tokyo Bay Highway connects Kisarazu City, Chiba Prefecture with Kawasaki City, Kanagawa Prefecture. Approximately 15 km long this driveway consists of a bridge part and a tunnel part, and length of the bridge is 4.4km.
(500kV XLPE cable was developed by Tokyo Electric Power Co., Chubu Electric Power Co., Kansai Electric Power Co., CRIEPI, Furukawa Electric Co. Ltd., Sumitomo Electric Indust., Fujikura Ltd., Hitachi Cable Ltd.)

Rear cover:

The Engineering Research Association for Superconductive Generation Equipment and Materials (Super-GM), under the Agency of Industrial Science and Technology of the Ministry of International Trade and Industry of Japan, was founded in September 1987 by 16 companies and organizations. The Super-GM makes R&D on superconducting generator, superconducting wire, refrigeration systems and total system from 1988 to 1998.

The superconducting generator has superconducting magnets in the rotor. Three types of superconducting rotors have been made by three manufacturers and assembled with a stator. The generator rated at 70 MVA with different rotors is tested in series in Osaka Power Station of Kansai Electric Power Company in Osaka Japan. Superconducting Equipments are anticipated to significantly contribute to energy and resource conservation and environmental preservation.
(Drawings in the rear cover are taken from a brochure of the Super-GM and a photo of testing is offered by Kansai Electric Power Company)

Members of EINA Committee in DEI

Hisanao	Yamashita	Chairman
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Teruyoshi	Mizutani	
Youichi	Nojima	
Syouichi	Ohhata	
Yoshimichi	Ohki	
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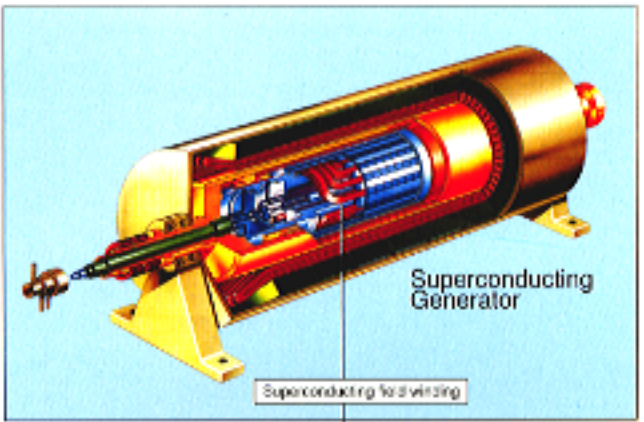
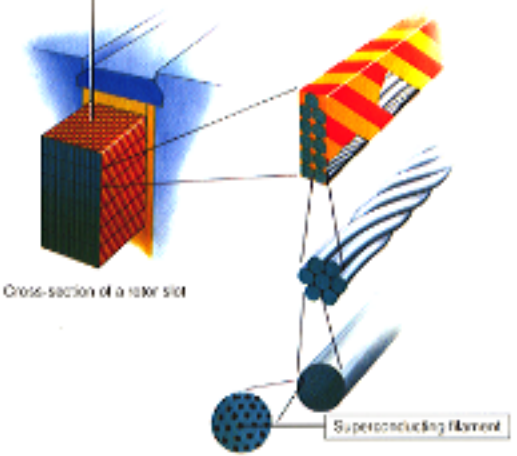
Yousuke	Sakai	
Tatsuo	Takada	
Kenji	Takahashi	
Ryozo	Takeuchi	
Toshikatsu	Tanaka	
Tsuneo	Tani	
Sachio	Yasufuku	



Operational Test of Superconducting Generator



A conductor is made by laying Superconductors of only a few microns in diameter in copper or other material in thousands to hundreds of thousand of strands to form a cable.

Cooperative Research Committee on Electrical Insulation News in Asia.

The Institute of Electrical Engineers of Japan
8th F HOMAT HORIZON Bldg., 6-2, Goban-cho,
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