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# ACTIVITIES OF THE TECHNICAL COMMITTEE ON DEI IN IEEJ

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## Digest Reports of Investigation Committees in DEI

### Investigating Committee on Functions of Organic Molecular Ultrathin Films, Organic/Inorganic Composite Films

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

The committee was established in July 2000, with the term of three years. The investigation has focused attention on functions of organic molecular films and organic/inorganic composite films related to

1. fabrication techniques and functions of organic molecular ultra thin films,
2. composite techniques and functions of

- organic/inorganic materials,
3. evaluating techniques of ultra thin films, and
4. properties of ultra thin film interfaces and device applications.

The results of the investigation will be summarized at the end of the terms as a technical report.

### Investigation Committee on Mechanism of Treeing Degradation and Influence of Polymer Morphology

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

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, many 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 the influence of polymer morphology on them.

Since the start, we have held 15 regular meetings and 15 secretary meetings. The results of investigation and survey will be published in Technical Report of IEEJ.

## Investigation Committee on Various Problems with High Reliability for Insulation of Electronic Equipment.

T.Tsukui (Tokai University)  
Y.Yamano (Chiba University)  
K.Shutoh (Science University of Tokyo)  
S. Yoda(Hioki E.E.Co.)

This investigation committee has started in April 1999 with 27 members. The main subjects of the committee are as follows.

- (1) Survey on test methods for insulating failures due to the ionic migration.
- (2) Survey on the insulating reliability with multi-constructed printed board.
- (3) Survey on insulating strength between the conductors against surge of high voltage.

We have held 9 committee meetings and two study meetings since the start of this committee. Now, we have started the round robin test with the surge endurance of the printed wiring board. Also we are surveying on practical problems with the insulating reliability occurring in the product of electronics equipments or products. At the end of the committee, we will publish the technical report.

## Investigation Committee on Life Limitation of Dielectric Insulation Materials and Electrical Apparatus

T.Ito (Musashi Institute of Technology)  
M.Miyamoto (Fuji Electric Corporate Research and Development, Ltd)  
K.Uchida (Chubu Electric Power Co., Inc.)  
Y.Ehara (Musashi Institute of Technology)  
K.Segawa (Toshiba Corporation)

The committee was established in April, 1999 with 30 members. The purpose of this committee is to survey and to discuss the relation of next keywords with electric rotating machine, power system

equipment, power cable and insulating material, 1: life limitation 2: electrical insulation diagnosis 3: insulating deterioration mechanism and process.

## Investigation Committee on Future Prospect of the Research and Development of Electrical and Electronic Insulation and its Systems

T. Tanaka (Central Research Institute of Electric Power Industry)  
K.Goto (Toshiba Corporation)  
M. Nagao (Toyohashi University of Technology)  
H. Nishikawa(Shibaura Institute of Technology)

Nearly matured technologies in electrical insulation and emerging technologies in electronics insulation are reviewed for future prospect of their R&D. Electrical insulation should be matched with social and technological requirements such as environmental

protection, transition from component technologies and system technologies, and downsizing and low cost. Electronics insulation faces with extreme downsizing and needs countermeasures against insulation degradation under the high electric stress.

# Cooperative Research Committee on EINA Magazine

T. Tanaka (Central Research Institute of Electric Power Industry)

Y. Inoue (Toshiba Corporation)

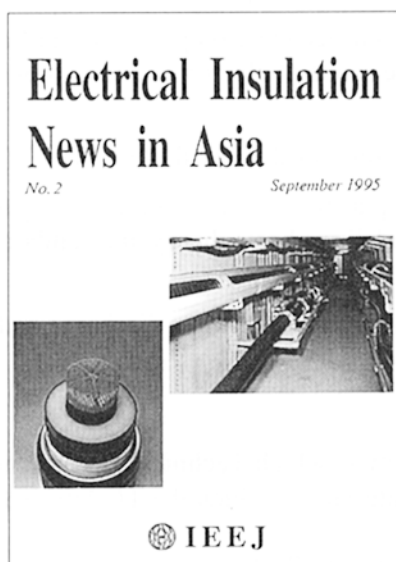
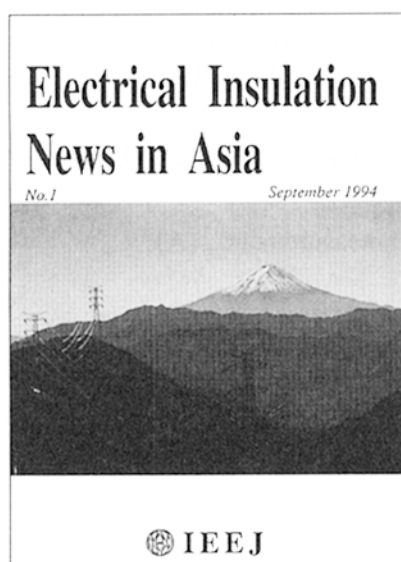
Y. Maruyama (Furukawa Electric Co., Ltd.)

Preceding committee ("Cooperative Research Committee (CRC) of Asian Interlink on Dielectrics and Electrical Insulation") worked from Jan. 1991 to Dec. 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 Apr. 1994 and edited and published "Electrical Insulation News in Asia (EINA)"

No. 1 - 5 (in every September from 1994 to 1998), and No. 6 (in November, 1999) and will publish EINA No.7 in November, 2000. The EINAs have gained favorable responses by questionnaires inserted in distributed EINAs.

The Home Page of the EINA magazine is now under construction. It will be open in the end of 2000 at the URL of <http://boss.eee.tut.ac.jp/eina/>

Front covers of the back numbers are shown hereinafter.



Front covers of the back numbers of EINA

## 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. 6 (1999). They are described in Japanese.

- No. 752 : “Deterioration of insulation materials for electric apparatus and cables and present state of insulation deterioration diagnosis criteria”, (A), p.136, Jan.,2000, ¥4,900.
- No. 757 : “Control of generation of charged particles and discharge in vacuum—Recent study results and technical review”, (A), p.63, Nov.,1999 ¥2,400.
- No. 765 : “Basic study, application and it’s diagnosis for generation of large scale high density and high homogenous plasma”, (A), p.60, Jan.,2000, ¥2,400.
- No. 767 : “Technical trend of the power cables in foreign countries”, (B), p.148, Mar.,2000, ¥5,100.
- No. 772 : “Life estimation of circuit printing plate under ion migration deterioration”, (A), p.48, Feb.,2000, ¥2,300.
- No. 777 : “Application technologies of high voltage capacitors”, (B), p.34, May,2000, ¥2,100.
- No. 778 : “Estimation technologies of surface electron phenomena of controlled polymer film and present state and future scope of electronic and photonic elements”, (A), p.104, Apr.,2000, ¥3,600
- No. 780 : “Technical trend of the arrestors for the distribution lines”, (B), p.50, Feb.,2000, ¥2,300.
- No. 790 : “Modeling of non-balanced plasma and fine manufacturing technique—Recent development of modeling, basic theory and fundamental measurement”, (A), p.100, May,2000, ¥2,800.
- No. 793 : “Trend of research on physics of pulsed power discharge and its high quality applications”, (A), p.48, Jun.,2000, ¥2,700.

N. B. : (A – E) after titles mean a Society in which Technical Committees work :

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 and micromachines

¥ : Japanese Yen

By Mr. Yoshio Maruyama (Furukawa Electric Co., Ltd.)