

# Advanced Insulating Materials and Condition Monitoring Diagnosis for HV Power Apparatus (HV)

## Oral Presentation

Nov. 9, 2011 (Wed.)

### HV 1 (Advanced Insulating Materials and Condition Monitoring Diagnosis for HV Power Apparatus 1)

Ballroom 1

Chairs: Prof. Suwarno (INSTITIT TEKNOLOGI BANDUNG, Indonesia)  
Prof. Yong Moo Chang (Hanyang University, Korea)

09:10-10:20

#### HVIS1 Signal Processing using Wavelet Transform for Partial Discharge Measurement and Waveform Analysis of Lightning Impulse Test

09:10-09:40

Invited Speech

Satoshi Matsumoto

*Shibaura Institute of Technology, Japan*

#### HV1552 Development of Diagnostic Sensor for Electrical Facilities using Metamaterial

09:40-10:00

Noh-Joon Park<sup>1</sup>, Ki Joung Lee<sup>2</sup>, Yong-Sung Lee<sup>2</sup>, Dae-Hee Park<sup>2</sup>

<sup>1</sup>*Korea Institute of Lighting Technology, Korea*, <sup>2</sup>*Wonkwang University, Korea*

#### HV1574 Dielectric Diagnostics of Power Apparatus, Part 2 - Application of Return Voltage Measurements on Power Cables and Power Transformers

10:00-10:20

Rainer Patsch

*University of Siegen, Germany*

Nov. 9, 2011 (Wed.)

### HV 2 (Advanced Insulating Materials and Condition Monitoring Diagnosis for HV Power Apparatus 2)

Ballroom 1

Chairs: Prof. Suwarno (INSTITIT TEKNOLOGI BANDUNG, Indonesia)  
Prof. Yong Moo Chang (Hanyang University, Korea)

10:40-12:20

#### HV524 Feasibility Study on Application of Biodegradable Insulation Oil in Malaysia Power Transformers

10:40-11:00

Abubakar A. Suleiman<sup>1,2</sup>, Nor Asiah Muhamad<sup>1</sup>, Ali Saeed Alghamdi<sup>1,3</sup>

<sup>1</sup>*Universiti Teknologi Malaysia (UTM), Malaysia*, <sup>2</sup>*National Agency for Science and Engineering Infrastructure (NASENI), Nigeria*, <sup>3</sup>*Jeddah Technical and Vocational School, Saudi Arabia*

#### HV1295 Influence of Rain Drops on Corona Discharge in AC Transmission Lines with a Corona Cage

11:00-11:20

Lan Chen, Xingming Bian

*Tsinghua University, China, Tsinghua University Shenzhen, China*

#### HV1297 Characteristics of Epoxy Resin/ SiO<sub>2</sub> Nanocomposite Insulation: Effects of Plasma Surface Treatment on the Nanoparticles

11:20-11:40

Wei Yan<sup>1,2</sup>, Toan Phung<sup>1</sup>, Zhaojun Han<sup>2</sup>, Kostya Ostrikov<sup>2</sup>

<sup>1</sup>*University of New South Wales, Australia*, <sup>2</sup>*Materials Science and Engineering, Australia*

## Advanced Insulating Materials and Condition Monitoring Diagnosis for HV Power Apparatus

### **HV1184 Investigating the Electromagnetic Wave Propagation Properties of Power Transformers Active Part for Partial Discharge Localization**

11:40-12:00

H. R. Mirzaei<sup>1</sup>, A. Akbari<sup>1</sup>, N. Shirdel<sup>1</sup>, K. Miralikhani<sup>2</sup>, M. Kharezi<sup>2</sup>

<sup>1</sup>K. N. Toosi University of Technology, Iran, <sup>2</sup>Iran-Transfo Company, Iran

### **HV1500 Application of Online PD Monitoring System using Multiple Sensors for GIS**

12:00-12:20

Min Chen, Koji Urano, Yan-jia Qin, Han-hui Kong, Zhi-ming Wu, Wei Zhou, Jian Tang

SE Technology Limited, China

Nov. 10, 2011 (Thu.)

### **HV 3 (Advanced Insulating Materials and Condition Monitoring Diagnosis for HV Power Apparatus 3)**

Ballroom 1

Chairs: Dr. Satoshi Matsumoto (Shibaura Institute of Technology, Japan)

09:10-10:20

Dr. Noh-Joon Park (Korea Institute of Lighting Technology, Korea)

### **HVIS2 Understanding of Partial Discharge Characteristics for Diagnosis of High Voltage Equipments**

09:10-09:40

Invited Speech

Suwarno

Institut Teknologi Bandung, Indonesia

### **HV1573 Dielectric Diagnostics of Power Apparatus, Part 1 - Theoretical Basis of Return Voltage Measurements -**

09:40-10:00

Rainer Patsch

University of Siegen, Germany

### **HV990 Analysis of ZnO Microvaristors in Insulation Materials with Circuit Simulator**

10:00-10:20

Mahmudul Kabir, Masafumi Suzuki, Noboru Yoshimura

Akita University, Japan

Nov. 10, 2011 (Thu.)

### **HV 4 (Advanced Insulating Materials and Condition Monitoring Diagnosis for HV Power Apparatus 4)**

Ballroom 1

Chairs: Dr. Satoshi Matsumoto (Shibaura Institute of Technology, Japan)

10:40-12:10

Dr. Noh-Joon Park (Korea Institute of Lighting Technology, Korea)

### **HVIS3 Material Characterization Technique of Polymers by Thermal Properties Analysis**

10:40-11:10

Jinpyo Kim

Invited Speech

YEONJIN Corporation, Korea

### **HV1509 Estimation of Dielectric Constant of Thick Film with Pattern using of Hardness**

11:10-11:30

Hyeong-Jun Kim<sup>1</sup>, Kibum Kim<sup>2</sup>, Jongcheol Kim<sup>3</sup>, Kyoung-Han Yoon<sup>4</sup>, Dong-Uk Sin<sup>4</sup>

<sup>1</sup>Korea Institute of Ceramic Engineering and Technology, Korea, <sup>2</sup>Samsung SDI, Korea,

<sup>3</sup>Eglas, Korea, <sup>4</sup>Hanyang Univ., Korea

**HV1541 Aging Effect Analyze of Long Period Operating Composite Insulators in Different Electric Field Position**

11:30-11:50

Yun-Peng Liu, Xiao-Hui Yang, Ying Liang, Rui-Feng Zhang  
*North China Electric Power University, China*

**HV751 Evaluation of Battery Thermal Performance by Infrared Radiation Thermal Imaging**

11:50-12:10

Hee-Jung Kim<sup>1</sup>, Joon-Hyun Lee<sup>2</sup>  
<sup>1</sup>*Global Battery CO., Ltd, Korea*, <sup>2</sup>*Pusan National University, Korea*

## Poster Presentation

Nov. 8, 2011 (Tue.)

**HVP 1 (Advanced Insulating Materials and Condition Monitoring Diagnosis for HV Power Apparatus) Poster Presentation 1**

Lobby 8F

Chair: Prof. Yong Moo Chang (Hanyang University, Korea)

14:00-15:30

**HV1629 Lifetime Management on 6.9kV Cable at Power Plants by Weibull Distribution**

Ki Joung Lee<sup>1</sup>, Yong-Sung Lee<sup>1</sup>, Noh-Joon Park<sup>2</sup>, Dae-Hee Park<sup>1</sup>  
<sup>1</sup>*Wonkwang University, Korea*, <sup>2</sup>*Korea Institute of Lighting Technology, Korea*

**HV1627 Investigation of Space Charge Distribution of LDPE/GO(Graphene Oxide) Nanocomposite for HVDC Application**

Youn Jin Kim<sup>1</sup>, Jin Ho Nam<sup>1</sup>, Son-Tung Ha<sup>1</sup>, Su Hyun Nam<sup>2,3</sup>, Cheol Min Park<sup>3</sup>, Chul Jong Han<sup>2</sup>  
<sup>1</sup>*LS Cable, Korea*, <sup>2</sup>*Korea Electronics Technology Institute, Korea*, <sup>3</sup>*Yonsei University, Korea*

**HV1612 Evaluation of Electrical Performance of Polymer Insulator in Salt Fog under DC Stress**

I. J. Seo<sup>1</sup>, J. Y. Koo<sup>1</sup>, J. K. Seong<sup>1</sup>, B. W. Lee, Y. J. Jeon<sup>2</sup>, C. H. Lee<sup>2</sup>  
<sup>1</sup>*Hanyang University, Korea*, <sup>2</sup>*PYUNGIL, Korea*

**HV1454 Research on Dynamic Breakdown of 600V HIV Wire**

Seung-Myeong Baek<sup>1</sup>, Jang-Gun Jung<sup>1</sup>, Sang-Hyun Kim<sup>2</sup>  
<sup>1</sup>*Changwon Munsung University, Korea*, <sup>2</sup>*Gyeongsang National University, Korea*

**HV1451 The Impact of Defects in the Insulation of the Power Distribution Cable Termination**

Seung-Myeong Baek<sup>1</sup>, Sang-Hyun Kim<sup>2</sup>, Young-Seok Kim<sup>3</sup>, Sun-Gu Kim<sup>3</sup>  
<sup>1</sup>*Changwon Munsung University, Korea*, <sup>2</sup>*Gyeongsang National University, Korea*,  
<sup>3</sup>*Electrical Safety Research Institute/Korea Electrical Safety Corporation, Korea*

## Advanced Insulating Materials and Condition Monitoring Diagnosis for HV Power Apparatus

### **HV1387 A Method to Monitor Vacuum Degree in Vacuum Interrupter using Ceramic Partial Discharge Sensor**

Jong-Ho Sun, Young-Woo Youn, Ki-Dong Song, Dong-Sik Kang  
*Korea Electrotechnology Research Institute(KERI), Korea*

### **HV1197 Dielectric Properties of Epoxy Resin with Filler and Hardener**

Ho-Shik Lee, Min-Woo Cheon, Yong-Pil Park  
*Dongshin University, Korea*

### **HV1079 Preparation and Characterization of Lithium-mica Glass-ceramic Containing Cr<sub>2</sub>O<sub>3</sub>**

S. Phumas, P. Pongwan, R. Tipakontitikul, A. Niyompan  
*Ubon Ratchathani University, Thailand*

### **HV1020 Mechanism of Brittle Fracture by Acid in Nonceramic Insulator**

Tae-Hwa Lee, Kwang-Yong Kim, Jung-Yun Heo, Han-Goo Cho  
*KERI, Korea*

### **HV1019 Electrical and Temperature Characteristics of Polymer Surge Arrester with Thermal Mechanical Stress and Manufacturing Conditions**

Han-Goo Cho, Kwang-Yong Kim, Tae-Hwa Lee, Jeong-Yun Heo  
*KERI, Korea*

### **HV1659 Steep Front Pulse Measurement of Coaxial Marx Generator for EMP Test**

Yong-Moo Chang<sup>1</sup>, Sang-Woog Lee<sup>2</sup>, Tae-Youn Kim<sup>2</sup>, Jae-Woong Jang<sup>3</sup>  
*<sup>1</sup>Hanyang University, Korea, <sup>2</sup>EMD, Korea, <sup>3</sup>KARI, Korea*

### **HV1657 Novel SWNT-UHF Fusion Sensor for Partial Discharge Detection of GIS**

Yong-Moo Chang<sup>1</sup>, Sang-Woog Lee<sup>2</sup>, Seunghyun Baik<sup>2</sup>, Jongchul Lee<sup>3</sup>  
*<sup>1</sup>Hanyang University, Korea, <sup>2</sup>Sungkyunkwan University, Korea, <sup>3</sup>Gangneung National University, Korea*

Nov. 10, 2011 (Thu.)

## **HVP 2 (Advanced Insulating Materials and Condition Monitoring Diagnosis for HV Power Apparatus) Poster Presentation 2**

Lobby 2F

Chair: Dr. Noh-Joon Park (Korea Institute of Lighting Technology, Korea)

13:30-15:30

### **HV983 Analysis of HV Electrical and Thermal Properties of Nano Epoxy Composites**

Jung-Hun Kwon, Sung-Hoon Cho, Kee-Joe Lim  
*Chung-buk National University, Korea*

**HV971 Fault Diagnosis of the Line Wire High Voltage Switchboard using UHF Methods**

Young-Sang Lee<sup>1</sup>, Chang-Hoon Kim<sup>1</sup>, Hee-Doo Park<sup>1</sup>, Gwi-Yeol Kim<sup>2</sup>, Boo-Hyung Ryu<sup>3</sup>, Jin-Woong Hong<sup>1</sup>

<sup>1</sup>Kwangwoon University, Korea, <sup>2</sup>Neo & Energy Corp., Korea, <sup>3</sup>Dongguk University, Korea

**HV955 AC / DC Composite Insulator Tracking Characteristics for Tracking Wheel Test**

Kwang-Yong Kim, Tae-Hwa Lee, Jung-Yun Heo, Han-Goo Cho  
Korea Electrotechnology Research Institute, Korea

**HV762 Flashover Phenomena Prevention during GIS Installation using Image Processing Technique**

Muhammad Faisal Agos, Nor Asiah Muhamad  
Universiti Teknologi Malaysia, Malaysia

**HV715 MgO/XLPE Compounds Prepared with Controllable Particle Size of MgO and Its Space Charge Properties**

Dong Hyun Lee<sup>1,2</sup>, Dae Sung Kim<sup>1</sup>, Yoon Jin Kim<sup>3</sup>, Jin ho Nam<sup>3</sup>, Gun Joo Lee<sup>3</sup>, Chongyoup Kim<sup>2</sup>, Seung-Ho Lee<sup>1</sup>

<sup>1</sup>Korea Institute of Ceramic Engineering & Technology (KICET), Korea, <sup>2</sup>Korea University, Korea, <sup>3</sup>LS cable, Korea

**HV712 Treeing Breakdown Characteristics of Epoxy/Layered Silicate Nanocomposites Prepared by Electric Field Dispersion Method**

Jae-Jun Park<sup>1</sup>, Jae-Young Lee<sup>2</sup>

<sup>1</sup>Joongbu University, Korea, <sup>2</sup>Woosuk University, Korea

**HV710 Treeing Breakdown Characteristics of Epoxy/Layered Silicate Nanocomposites Prepared by an Ultrasonic Dispersion**

Jae-Jun Park<sup>1</sup>, Byoung-Bok Yoo<sup>1</sup>, Jae-Young Lee<sup>2</sup>

<sup>1</sup>Joongbu University, Korea, <sup>2</sup>Woosuk University, Korea

**HV708 Effect of Silane Coupling Agent on the Treeing Breakdown Characteristics of Epoxy/Layered Silicate Nanocomposites**

Jae-Jun Park<sup>1</sup>, Geun-Bae Kang<sup>1</sup>, Jae-Young Lee<sup>2</sup>

<sup>1</sup>Joongbu University, Korea, <sup>2</sup>Woosuk University, Korea

**HV704 Treeing Breakdown Characteristics of Epoxy/Layered Silicate Nanocomposites Prepared by 3-Roll Mill**

Jae-Jun Park<sup>1</sup>, Jae-Young Lee<sup>2</sup>

<sup>1</sup>Joongbu University, Korea, <sup>2</sup>Woosuk University, Korea

**HV702 Analysis of Insulation Properties of Epoxy Compounded with Nano Particles for Electrical Machine**

Yu-Min Kim<sup>1</sup>, Jung-Hun Kwon<sup>1</sup>, Kee-Joe Lim<sup>1</sup>, Eui-Hwan Jung<sup>2</sup>

<sup>1</sup>Chung-buk National University, Korea, <sup>2</sup>LS-cable, Korea

## Advanced Insulating Materials and Condition Monitoring Diagnosis for HV Power Apparatus

### **HV696 A Study of High-Voltage Generator of Frequency Modulation Method for Mobile Diagnostic X-ray**

Young-Pyo Kim<sup>1</sup>, Tae-Gon Kim<sup>1</sup>, Min-Woo Cheon<sup>2</sup>, Ho-Shik Lee<sup>2</sup>, Yong-Pil Park<sup>2</sup>  
<sup>1</sup>Dongshin University Graduate School, Korea, <sup>2</sup>Dongshin University, Korea

### **HV645 The Analysis of Corona Discharge for Aging Diagnosis of Power Facility**

Jae-Hyeong Choi<sup>1</sup>, Man-Sik Pang<sup>1</sup>, Woo-Jin Kim<sup>1</sup>, Young-Seok Kim<sup>2</sup>, Sang-Hyun Kim<sup>1</sup>  
<sup>1</sup>Gyeongsang National University, Korea, <sup>2</sup>Korea Electrical Safety Corporation, Korea

### **HV580 Influence of New Arc Quenching Methods for Improving the Interrupting Capability of Low Voltage Circuit Breaker**

Sung-Hoon Cho<sup>1</sup>, Yu-Min Kim<sup>1</sup>, Kee-Joe Lim<sup>1</sup>, Kil-Sou Kim<sup>2</sup>  
<sup>1</sup>Chungbuk National University, Korea, <sup>2</sup>LSIS, Korea

### **HV542 Evaluation of Non-destructive Test Techniques on Laboratory Aged Water Treed MV-XLPE Cables**

N. H. Malik<sup>1</sup>, M. I. Qureshi<sup>1</sup>, A. A. Al-Arainy<sup>1</sup>, A. A. Al-Hamood<sup>2</sup>  
<sup>1</sup>King Saud University, Saudi Arabia, <sup>2</sup>Saudi Arabian Oil Company, Saudi Arabia

### **HV520 Effect of Particle Size and Dispersion on Dielectric Properties in ZnO/ Epoxy Resin Composites**

Wenhu Yang, Ran Yi, Yang Xu, Man Xu, Sisi Hui, Xiaolong Cao  
Xi'an Jiaotong University, China

### **HV366 Arc Resistance of PTFE Composites for Circuit Breaker**

Hoyyul Park, Dongjun Kang, Myeongsang Ahn, Dongpil Kang  
Korea Electrotechnology Research Institute, Korea

### **HV274 Evaluation of Electrical Insulation Characterization of XLPE Containing Nano ZnO Filler**

Sung-Hoon Cho<sup>1</sup>, Yu-Min Kim<sup>1</sup>, Kee-Joe Lim<sup>1</sup>, Jin-Ho Nam<sup>2</sup>  
<sup>1</sup>Chungbuk National University, Korea, <sup>2</sup>LS Cable, Korea

### **HV218 Transformer Faults Interpretation System Based on 4 Dissolved Gases Analysis Methods**

Ali Saeed Alghamdi, N. A Muhamad, Abubakar Abdulkareem Suleiman  
Universiti Teknologi Malaysia, Malaysia

### **HV212 Temperature Pattern during Void Discharge in XLPE Cable**

R. A. Zainir, N. A. Muhamad  
University Technology of Malaysia, Malaysia

### **HV205 Comparative Study on Conductivity and Moisture Content using Polarization and Depolarization Current (PDC) Test for HV Insulation**

Nor Akmal Mohd Jamail<sup>1,2</sup>, Mohamed Afendi Mohamed Piah<sup>2</sup>, Nor Asiah Muhamad<sup>2</sup>  
<sup>1</sup>University of Tun Hussein Onn Malaysia(UTHM), Malaysia, <sup>2</sup>Universiti Teknologi Malaysia(UTM), Malaysia

**HV204**      **Conductivity Variation using Polarization and Depolarization Current (PDC) Measurements of HV Equipment Insulation System**

Nor Akmal Mohd Jamail<sup>1,2</sup>, Mohamed Afendi Mohamed Piah<sup>2</sup>, Nor Asiah Muhamad<sup>2</sup>

<sup>1</sup>University of Tun Hussein Onn Malaysia(UTHM), Malaysia, <sup>2</sup>Universiti Teknologi Malaysia (UTM), Malaysia

**HV1110**      **Modeling of Electromagnetic Wave Propagation with Tapered Transmission Line**

Kun-Ah Lee, Jeong-Won Kim, Kwang-Cheol Ko

*Hanyang University, Korea*