

# **INSUCON 2013 PROGRAMME**

## **DAY 1**

### **Opening address**

**Dr Jeremy Wheeler – Insucon Chairman 08.45 - 09.00**

### **Session 1 – Rotating machines 09:00 – 10:35**

**Session Chairman: Dr Greg Stone**

#### **Investigations of ageing of a motorformer cable wound stator**

E. Mårtensson, B. Ahlinder and K. Magnusson

#### **A new technique for holistic monitoring of rotating high voltage (HV) machines, combining thermal, electrical, ambient and mechanical (TEAM) stress monitoring**

L. Renforth, S. Goodfellow, W. Waugh, D. Clark and R. Shuttleworth

#### **Comparison of 60 Hz and 0.1 Hz overvoltage levels on stator winding insulation**

H.G. Sedding, A.J. Brown (Kinectrics Inc., Canada) & J. Stein (EPRI, USA)

#### **Evaluation of rotating machine insulation using SFRA and FDS testing**

A. Contin, J. Borghetto, G. Pirovano and A. Piccolo

#### **Automatic repetitive PD inception voltage measurement of motorette sample simulating inverter-fed motor insulation by using repetitive impulse voltage generator**

M. Hikita, T. Ueno, Y. Kudo, M. Kozako, H. Ogawa, T. Sakurai, K. Nakayama, T. Yoshimitsu, T. Hirose and S. Hiroshima

### **Session 2 – High voltage measurements 11:05 – 12:40**

**Session Chairman: Prof. Simon Rowland**

#### **Non-destructive insulation condition assessment using rapid spectral measurement methods**

G.C. Stevens, H. Herman, P. Baird and W. Mortimore

#### **RF detection of electrical tracking**

R. Giussani, I. Cotton and R. Sloan

#### **Condition assessment of cables in nuclear power plants**

A. Anandkumaran & H.G. Sedding - Kinectrics Inc.

#### **Withstand voltage of liquid nitrogen in the presence of gas bubbles**

S. Fink, W-S. Kim, M. Noe and V. Zwecker

#### **Laser ablation of cryogenic dielectrics**

L.H. Truong and P.L. Lewin

### **Session 3 – Partial discharge measurements**

**13:40 – 15:45**

Session Chairman: **Prof. Martin Judd**

**Keynote Paper** by Prof. P Lewin, University of Southampton

**The state of the art of condition monitoring: where do we go from here?**

P. Lewin, S. Rowland, V. Catterson, C. Johnston, C. Walton, J. Steele-Davies

**De-noising approaches for partial discharge measurements – a comparison of methods and their practical application**

A. Kraetge, S. Hoek, R. Hummel, M. Krüger, O. Kessler, C. Enk and D. Brazier

**Normalizing partial discharge data from large high voltage motors**

A. Vouk, R.W. Carlson and H.A. Balfagih

**Motor coil design for electric aircraft**

J. Moeneclaey, S. Duchesne, D. Roger and P.Y. Liegeois

**Partial discharge measurements in magnet wires using impulsive voltages**

L. Fornasari, W. Chen, G.C. Montanari, G. Gao

**Electrical degradation of polymeric films for photovoltaic devices caused by partial discharge phenomenon**

R. Tang; J.J. Liggat and W.H. Siew

### **Session 4 – Material processing & characterisation**

**16:15 – 17:50**

Session Chairman: **Prof. Gary Stevens**

**Life cycle assessment of a 72.5 kV SF<sub>6</sub>-free live tank circuit breaker**

Y. Kieffel, A. Spinosa and A. Girodet

**Thermal conductivity of aramid and cellulose papers in liquid-immersed insulation systems**

R. Szewczyk, J-C. Duart, R. Marek and E. Key

**Nanocomposite electrical insulation material development for HVDC applications**

J.G.C. Samuel, M. Fu, F. Perrot, G. Stevens, A. Pye, A. Vaughan, P. Baker, J. Cooper, G. Tzemis, D. Walker, A. Robertson

**Traditional and new epoxy systems for vacuum pressure impregnation of electrical machines**

C. Beisele, D. Bär and S. Colliard

**Adhesion of enamel films on aluminium wires**

K. Lienert

## **DAY 2**

### **Session 5 – Transformer insulation**

**08:30 – 10:30**

**Session Chairman: Dr Alan Wilson**

#### **An updated review of paper ageing in power transformers**

H. Ding, R. Heywood, J. Lapworth, S. Ryder and A. Wilson

#### **Field experience and diagnostic assessment of power transformers by recovery voltage method**

C. Viswanatha and T.R. Afzal Ahamed

#### **Frequency response interpretation of a delta winding in transformer bulk in low- and mid-frequency ranges**

T.M.T. Pham, D.A.K. Pham, A. Kazemi, H. Borsi, E. Gockenbach

#### **Depolarization behaviour of oil and oil-impregnated paper**

R. Wiengarten, F. Jenau, B. Bakija and D. Breiffelder

#### **The voltage and current characteristics at the first instant of breakdown in transformer oil under A.C. voltage**

S. Abdi, A. Boubakeur, N. Harid and A. Haddad

#### **Electrical insulation design for high voltage inverter transformer**

K.C.Lee and S.K.Choi

### **Session 6 – Rotating machines**

**11:00 – 12:40**

**Session Chairman: Dr Howard Sedding**

#### **25 years experience with on-line partial discharge testing of stator windings**

G.C. Stone and M. Sasic

#### **Interpretation of tan delta test results on complete VPI stator windings of electric motors 6.6kV-13.8kV.**

D. Steenkamp

#### **Qualification of a medium voltage flexible stator coil insulation system for on-site rewinding**

S.Ul Haq, R. Omranipour and G. Hanna

#### **New type of PD-resistant enamelled wire**

G. Paulsson

#### **Void content evaluation in insulation of rotating machines using X-ray tomography**

A. Contin, G. Schena, G.L. Stanic and G. Peruzzi

## **Session 7 – Cables insulation**

**13:40 – 15:40**

**Session Chairman: Dr Ross Mackinlay**

### **Method for on-site testing of high voltage cables using continuous AC voltages**

M. Jochim

### **Calculating the thermal impact of cable crossings**

Z. Huang, J. A. Pilgrim P. L. Lewin, F. Waite and D. Payne

### **Effect of thermal ageing on the properties of XLPE as an insulating material for HV cables**

Y. Mecheri, S. Bouazabia, A. Boubakeur and M. Lallouani

### **New recyclable power cable insulation materials based upon polyolefin blends**

A.S. Vaughan, G.C. Stevens, I. Hosier, A. Pye, C. Green, S. Sutton and J. Cooper

### **Influence of cross-linking process and by-products on space charge build-up in materials for HVDC cable insulation**

T. Tran Anh, F. Roig, P. Notingher, J-P. Habas, V. Lapinte, S. Agnel, J. Castellon, A. Allais and L. Kebbabi

### **HVDC cables during a long-term ageing programme**

C. Green, J. Fothergill, S. Dodd, M. Fu, F. Perrot, J. Castellon, P. Mirebeau, D. Dubois, L. Boyer, H. Tanaka and H. Niinobe.

## **Session 8 – High voltage measurements**

**16:10 – 17:50**

**Session Chairman: Prof. Manu Haddad**

### **Potential distribution measurement on the stress grading system of high voltage rotating machines with high temporal resolution by Pockels sensor**

A. Kumada, Y. Kiuchi, H. Ikeda, K. Hidaka, Y. Tsuboi, S. Yamada, and T. Yoshimitsu

### **Evaluation test of insulation materials for traction motors in a hybrid electrical vehicle / electrical vehicle**

S.S.W. Lee, N. Hwang and B. Li

### **On-line PD (Partial Discharge) testing of some of the worst performing circuits on a utility distribution system**

D. Clark, R. Mackinlay, M. Seltzer-Grant, S. Goodfellow, L. Renforth, J. McWilliam and R. Shuttleworth

### **Improvement of VFTO measuring technique for disconnecter bus transfer charging tests**

S. Fifi, Th. Berteloot, A. Girodet and P. Vinson

### **Dielectric Behaviour of Different Vapour Shield in Vacuum**

T. Psotta

## **DAY 3**

### **Session 9 – Outdoor Insulation**

**08:45 – 10:25**

Session Chairman: **Dr Jeremy Wheeler**

#### **Partial discharge of water droplets on polymeric insulating surfaces**

M.H. Nazemi and V. Hinrichsen

#### **Enhanced solid-layer tests for polymeric outdoor insulators**

RT Waters, M Albano, P Charalampidis, H Griffiths, A Haddad

#### **Superior outdoor performance of indoor epoxy coated with RTV silicone coatings**

S. Tzavalas, A. Michalik, H.D. Le and P. Mahonen

#### **Design and testing of a 400 kV insulating cross-arm**

C. Zachariades, V. Peesapati, I. Cotton, S.M. Rowland and D. Chambers

#### **New paper-free insulation technology for a dry high voltage condenser bushing**

U. Krüsi, A. Dais, Z. Zic and D. Egger

### **Session 10 – Ester dielectric fluids**

**10:55 – 12:40**

Session Chairman: **Prof. Zhongdong Wang**

#### **Transformer design and natural ester fluids**

K.J. Rapp and J. Luksich

#### **Application of ester liquids in power transformers**

Z.D. Wang, Q. Liu, X. Yi, X. Wang, F. Perrot, C. Perrier, P. Dyer, P. Jarman, G. Wilson, D. Walker, R. Martin and J. Noakhes

#### **Study on cellulosic insulation impregnated with mineral and ester oils: Creeping discharges (AC, DC, LI) and ageing stability**

M-L. Coulibaly, C. Perrier and M. Marugan

#### **Impact of sulphur in oil on the insulation system of large power transformers in service**

C. Viswanatha, J. Sundara Rajan and G.R. Viswanath

#### **Influence of cellulosic particles on lightning impulse breakdown voltages of ester transformer liquids in a uniform Field**

W. Lu, Q. Liu and Z.D. Wang