



Study Committee D1

Materials and Emerging Test Techniques

PRESENTATION OF ACTIVITIES* IN CIGRE Study Committee- D1

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SC has changed the name since last Main Session in 2008

- Material slightly modified from Prof. Gockenbach's, SC-D1 Convenor's original presentation at the CIGRE-D1 session in Paris during August 2010



Study Committee D1

Materials and Emerging Test Techniques

OVERVIEW

- Mission of CIGRE D1
- Membership
- Activities conducted by CIGRE D1
- Deliverables by CIGRE D1

SC Chairman: Dr. Josef Kindersberger (DE)

Secretary : Dr. Joachim Holbøll (DK)



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Materials and Emerging Test Techniques

Main Activities for Study by SC D1

- New and existing electrical insulating and electrical conducting materials for electro-technology
- Emerging test technologies and diagnosis techniques
- Support of other Study Committees in their analysis of recently introduced or new materials being developed, emerging test technologies, and diagnosis techniques



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Membership within SC-D1

24 Regular members

11 Observer members

All Working Group convenors

All Advisory Group convenors



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Existing Advisory Groups

SCA	Strategic and Customer Related
01	Liquid and Liquid Impregnated Insulation Systems
02	High Voltage and Current Testing and Diagnostic
03	Gas Insulation
04	Solid Insulation

The activities are carried out by 19 working groups plus 5 advisory groups. The composition of the Advisory Groups might change



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Working Groups in the Field of Liquid and Liquid Impregnated Insulation Systems

- 29 PD recognition in liquid impregnated systems for transformers
- 30 Oxidation stability of transformer liquids
- 31 Dielectric Performance of insulating liquids for transformers
- 32 New Application of DGA
- 34 Condition assessment for oil impregnated AC cables
- 41 HVDC Transformer polarity reversal: Role of oil conductivity (JWG with SC A2)



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Working Groups in the Field of High Voltage and Current Testing and Diagnostic

- 17 HV Asset Condition Assessment Tools, Data Quality - Expert Systems
- 35 Performance of high-voltage and high-current measurement systems for high voltage testing HV Asset Condition Assessment Tools, Data Quality - Expert Systems
- 36 Requirements for UHV Test Techniques



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Working Groups in the Field of High Voltage and Current Testing and Diagnostic

- 37 Maintenance and evaluation of measuring procedures for conventional and unconventional partial discharge testing
- 38 Emerging Test Techniques Common to High Temperature Superconducting (HTS) Power Applications
- 39 Methods for Diagnostic/Failure Data Collection and Analysis



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Working Groups in the Field of Gas Insulation

- 25 Application Guide for PD Detection in GIS using UHF or Acoustic Methods
- 28 Optimized GIS by Dielectric Coated Electrodes and Functionally Graded Materials



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Working Groups in the Field of Solid Insulation

- 19 Solid insulation endurance stressed by repetitive transient voltages caused by power electronics
- 20 Water Tree Detection in XLPE insulation (JWG with SB B1)
- 23 Diagnostics and Accelerated Life Endurance Testing of Polymeric Materials for HVDC Application
- 24 Potential of Polymer Nanocomposites as Electrical Insulation for Highly Stressed Insulation Material in AC and DC Application



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Working Groups in the Field of Solid Insulation

- 26 Basic Principles to Determinate Methane Content of Cross-linked Solid Extruded Insulation of MV and HV Cables
- 27 Material Properties for New and Nonceramic Insulation
- 42 Radiation Ageing of Polymeric Insulating Material



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Working Groups in the Field of Capacitors

05 Status of the Capacitors for Power System Technology



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Liaisons with other SC in CIGRE

with all other SC due to the horizontal functions,
but at the moment mainly with

- A1 Rotating Machines
- A2 Transformers
- B1 Insulated Cables
- C4 System Technical Performance



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Liaisons with the IEC bodies

- TC 02 Rotating Machinery
- TC 10 Fluids for Electrotechnical Applications
- TC 15 Standards on Specifications for Electrical Insulating Material
- TC 28 Insulation Co-ordination
- TC 33 Power Capacitors



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Liaisons with the IEC bodies

- TC 33 Power Capacitors
- TC 36 Insulators
- TC 42 High Voltage Test Techniques
- TC 112 Evaluation and Qualification of Electrical Insulating Materials and Systems
- TC 115 High Voltage Direct Current (HVDC) Transmission for Voltages above 100 kV



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Publications (available)

- Status of Development and Field Test Experience with High-Temperature Superconducting Power Equipment
- Report on Gas Monitors for Oil-Filled Electrical Equipment
- Insulating Oil Reclamation and Dechlorination



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Publications (under preparation)

- Generic guidelines for life time condition assessment of HV assets and related knowledge rules
- Important Material Properties of RTV Silicone Rubber Insulator Coatings
- Guidelines for Unconventional Partial Discharge Measurements
- DGA in Non-Mineral Oils and Load Tap Changers and Improved DGA Diagnosis Criteria
- Polymer nanocomposites - Fundamentals and possible applications to power sectors



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Publications (under preparation)

- Evaluation of dynamic hydrophobicity properties of polymeric materials for non-ceramic outdoor insulation – Retention and transfer of hydrophobicity
- Requirements on testing flammability of polymeric materials for outdoor insulation
- Report on resistance to weathering and UV of polymeric materials



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Preferential Subject 1:

New materials for improved efficiency and sustainability of AC and DC power equipment

Special Reporter S. M. Gubanski, SE

Papers: 6, Contributions: 11, Spontaneous: 8

Preferential Subject 2:

Challenges for testing and diagnostics

Special Reporter: Michael Muhr, AT

Papers: 17, Contributions: 23, Spontaneous: 19

Preferential Subject PS 3:

Endurance of materials especially in harsh electrical and physical environments

Special Reporter: S. M. Gubanski

Papers: 2, Contributions: 1, Spontaneous: 1



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Next meeting: With SC-A2 (Transformers)

Location: Doshisha University, Kyoto, Japan

SC Meeting Dates: Sept 11-16, 2011



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If interested in learning about the activities within this Study Committee please contact

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