



2016 Activity Report

Study Committee D1

1. Highlights

- 2 new WGs were launched (2 WG D1)
- 4 Technical Brochures have been published
- 2 Tutorials were held

2. Working Group changes since the last TC meeting

- a. New WG
 - i. D1.66 Partial discharge detection under DC voltage stress
 - ii. D1.67 Electrical insulation systems at cryogenic temperatures
- b. WG Disbanded
 - i. D1.25 Application guide for PD detection in GIS using UHF or acoustic methods
 - ii. D1.29 Partial Discharges in Transformers
 - iii. D1.31 Dielectric Performance of insulating liquids for transformers
 - iv. D1.36 Special requirements for dielectric testing of Ultra High Voltage (UHV) equipment
 - v. D1.37 Maintenance and evaluation of measuring procedures for conventional and unconventional partial discharge testing
 - vi. D1.38 Emerging Test Techniques Common to High Temperature Superconducting (HTS) Power Applications
 - vii. D1.39 Methods for Diagnostic/Failure Data Collection and Analysis
 - viii. D1.40 Functional Nanomaterials for Electric Power Industry
 - ix. D1.43 Rotating machine insulation voltage endurance under fast, repetitive voltage transients
- c. Total number of active, WGs, JVGs: 23 (19 WG D1, 2 JWG D1/X, 2 JWG X/D1 (not listed in Appendix))
- d. Allocation of WG to the 4 TC Strategic Directions and the 10 Technical Issues of the Network of the Future (only one SD and TI per WG)
→ see Appendix

3. Publications

- a. Publications during 2016
 - CIGRE TB 646 “HVDC Transformer insulation: oil conductivity”, (JWG A2/D1.41), January 2016
 - CIGRE TB 654 “UHF partial discharge detection system for GIS: Application guide for sensitivity verification” (WG D1.25), April 2016
 - CIGRE TB 661 “Functional nanomaterials for electric power” (WG D1.40), August 2016
 - CIGRE TB 662 “Guidelines for partial discharge detection using conventional (IEC 60270) and unconventional methods” (WG D1.37), August 2016



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- b. Publication plan for the coming year
 - TB xxx Requirements for UHV test techniques (WG D1.36)
 - TB xxx Methods for Diagnostic/Failure Data Collection and Analysis (WG D1.39)
 - TB xxx Rotating machine insulation voltage endurance under fast repetitive voltage transients (WG D1.43)
 - TB xxx Testing of naturally polluted insulators (WG D1.44)
 - TB xxx New Frontiers of Dissolved Gas Analysis (DGA) interpretation for Power Transformers and their Accessories (JWG D1/A2.47)
- c. Green Books progress
 - SC D1 has no plans for a Green Book

4. Tutorials and workshops in 2016

- Tutorial “Partial Discharges in Transformers”; Jitka Fuhr (WG D1.29), Cigre Australia, November 2016, Sydney (AU)
- Tutorial “PD Diagnostics of GIS/GIL: Sensitivity Verification and Risk Assessment based on UHF Method”; Wojciech Koltunowicz (tutorial is based on results of WG D1.03, D1.25 & WG D1.37), GCC POWER 2016, Doha - State of Qatar, 7-10 November 2016

5. Strategic Plan and Action Plan

still valid

6. Planned SC meetings (in 2017 and next)

- In 2017 SC D1 will meet in Winnipeg, Canada, October (1st till 6th), 2017
- In 2018 SC D1 will meet in Paris, France, August, 2018
- In 2019 SC D1 will meet in New Delhi, India

7. Participation to Regional Meetings, colloquia and symposia

- a. In 2016 (passed)
 - no regional meetings, colloquia or symposia
- b. In 2017 and beyond (scheduled)
 - CIGRE SC A3/B4/D1 Colloquium 2017 in Winnipeg (CA), Oct. 1-6, 2016
 - CIGRE SC A2/D1 Colloquium 2019 in New Delhi (IN)

8. Liaisons and Relations with other organisations

Good relations have been established to the relevant IEC Technical Committees; often CIGRE SC D1 experts are active in IEC working bodies and vice versa.

The main partners within IEC are:

TC 2 “Rotating Machines”,
TC 10 “Fluids for Electrotechnical Applications”,
TC 14 “Power Transformers”,
TC 36 “Insulators”,



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TC 42 “High-Voltage and High-Current Test Techniques”,
TC 90 “Superconductivity” (Category A liaison to IEC TC 90, since Nov. 2012),
TC 112 “Evaluation and Qualification of Electrical Insulating Materials and Systems“

The past chairman of SC D1 happened to be chairman of IEC TC 36 (term of office ended January 2015); the chairman of TC 42 is the second last chairman of SC D1. SC D1 has also good relationship to the relevant IEEE organisations mainly by the same members in the two organisations.

9. Specific actions for the recruitment of young experts, Place of Women in the SC

Special attention is paid to these subjects. There is consensus that SC D1 shall be open to young experts in as many groups as possible and female experts are most welcome.

10. SC website: On-line contents and date of last update

The D1 Website contains relevant information for D1 members and (WG-) experts. The website is updated whenever modifications need to be done (latest update: August 2016).

11. Miscellaneous



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Appendix: Allocation of Working Groups to the four TC strategic directions

	Type	WG No	Title	Main TI	Main SD	Distrib. issues
1	WG	D1.44	Testing of naturally polluted insulators		SD 2	Yes
2	JWG	D1.47	New Frontiers of Dissolved Gas Analysis (DGA) Interpretation for Power Transformers and their Accessories		SD 2	Yes
3	WG	D1.48	Properties of insulating materials under VLF voltages		SD 2	Yes
4	JWG	D1.49	Harmonised test for the measurement of residual inflammable gases in insulating materials by gas chromatography	8	SD 3	Yes
5	WG	D1.50	Atmospheric and altitude correction factors for air gaps and clean insulators	4	SD 1	Yes
6	WG	D1.51	Dielectric performance of eco-friendly gas insulated systems	7	SD 3	No
7	WG	D1.52	Moisture measurement in insulating fluids and transformer insulation – An evaluation of solid state sensors and chemical methods	8	SD 1	Yes
8	WG	D1.53	Ageing of upgraded cellulose and cellulose impregnated in ester liquids and other liquids (Revision of Technical Brochure No 323)	8	SD 1	Yes
9	WG	D1.54	Basic principles and practical methods to measure the AC and DC resistance of conductors of power cables and overhead lines	9	SD 2	Yes
10	WG	D1.56	Field grading in electrical insulation systems	3	SD 1	Yes
11	JWG	D1.57	Dielectric Testing of Gas-insulated HVDC Systems	3	SD 1	No
12	WG	D1.58	Evaluation of dynamic hydrophobicity of polymeric insulating materials under AC and DC voltage stress	3	SD 1	Yes
13	WG	D1.59	Methods for dielectric characterisation of polymeric insulating materials for outdoor applications		SD 1	Yes
14	WG	D1.60	Traceable measurement techniques for very fast transients	6	SD 1	Yes
15	WG	D1.61	Optical corona detection and measurement		SD 2	Yes
16	WG	D1.62	Surface degradation of polymeric insulating materials for outdoor appl.		SD 2	Yes
17	WG	D1.63	Partial discharge detection under DC voltage stress	3	SD 1	Yes
18	WG	D1.64	Electrical insulation systems at cryogenic temperatures	9	SD 1	Yes
19	WG	D1.65	Mechanical properties of insulating materials and insulated conductors for oil insulated power transformers		SD 1	Yes
20	WG	D1.66	Requirements for partial discharge monitoring systems for gas insulated systems	8	SD 2	No
21	WG	D1.67	Dielectric performance of new non-SF6 gases and gas mixtures for gas-insulated systems	7	SD 3	Yes

+ Technical Issues (cf. Electra 256 June 2011):

* Strategic Directions (cf. Electra 249 April 2010):

1 : The electrical power system of the future

3 : Focus on the environment and sustainability

2 : Making the best use of the existing power system

4 : Preparation of material readable for non technical audience