2015 Activity Report

Study Committee D1

1. **Highlights**
   - 3 new WGs were launched (3 WG D1)
   - 6 Technical Brochures have been published
   - 3 Tutorials were held

2. **Working Group changes since the last TC meeting :**
   a. New WG
      i. D1.63 Partial discharge detection under DC voltage stress
      ii. D1.64 Electrical insulation systems at cryogenic temperatures
      iii. D1.65 Mechanical properties of insulating materials and insulated conductors for oil insulated power transformers

   b. WG Disbanded
      i. D1.23 Diagnostics and accelerated life endurance testing of polymeric materials for HVDC application
      ii. D1.27 Material Properties for New and Non-ceramic insulation
      iii. D1.34 Condition assessment for oil-impregnated insulation used in AC cables
      iv. D1.38 Emerging Test Techniques Common to High Temperature Superconducting (HTS) Power Applications
      v. D1.42 Radiation Ageing of Polymeric Insulating Materials
      vi. D1.45 Testing of naturally polluted insulators under heavy rain

   c. Total number of active, WGs, JWGs: 28

   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 2015
      - CIGRE TB 611 Feasibility study for a DC Tracking & Erosion test (WG D1.27), March 2015
      - CIGRE TB 620 Radiation ageing of polymeric insulating materials and relevant testing (WG D1.42), June 2015
      - CIGRE TB 627 Condition assessment for fluid-filled insulation in AC cables (WG D1.34), July 2015
      - CIGRE TB 634 Impact of rain on insulator performance (WG D1.45), October 2015
      - CIGRE TB 636 Diagnostics and accelerated life endurance testing of polymeric materials for HVDC application (WG D1.23), November 2015
      - CIGRE TB 644 Common characteristics and emerging test techniques for high temperature superconducting power equipment (WG D1.38), December 2015

b. Publication plan for the coming year
- TB xxx Application guide for pd detection in GIS using UHF or acoustic methods (WG D1.25)
- TB xxx Partial discharges in transformers (WG D1.29)
- TB xxx Dielectric performance of insulating liquids for transformers (WG D1.31)
- TB xxx Requirements for UHV test techniques (WG D1.36)
- TB xxx Maintenance and evaluation of measuring procedures for conventional and unconventional partial discharge testing (WG D1.37)
- TB xxx Methods for Diagnostic/Failure Data Collection and Analysis (WG D1.39)
- TB xxx Functional Nanomaterials for Electric Power Industry (WG D1.40)
- 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 Bas 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 2015
- Tutorial on "Gas Monitors for oil filled equipment", by Michel Duval on behalf of WG D1.47, Technical Brochure 409 (2010), TechCon+Cigre Australia, April 20th 2015
- Tutorial "Diagnostics & Monitoring of Gas-insulated Systems - Present & Future" by Uwe Riechert on behalf of WG D1.36, SC D1 Colloquium, Rio de Janeiro, September 16th 2015
- Tutorial "Materials, Technologies, Testing and Diagnosis for Polymeric Overhead Line Insulators" by Jens Seifert on behalf of WG D1.27, SC D1 Colloquium, Rio de Janeiro, September 16th 2015

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 2015 (passed)
CIGRE SC D1 Colloquium 2015 in Rio de Janeiro (BR), Sept. 13-18, 2015
b. In 2016 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”,
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 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 past 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: February 2016).

11. Miscellaneous

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

	Type	WG No	Title	Main TI	Main SD	Distrib. issues
1	WG	D1.25	Application guide for PD detection in GIS using UHF or acoustic methods		SD 1	No
2	WG	D1.29	Partial Discharges in Transformers		SD 2	Yes
3	WG	D1.31	Dielectric Performance of insulating liquids for transformers		SD 3	Yes
4	WG	D1.36	Special requirements for dielectric testing of Ultra High Voltage (UHV) equipment		SD 1	No
5	WG	D1.37	Maintenance and evaluation of measuring procedures for conventional and unconventional partial discharge testing		SD 2	Yes
6	WG	D1.38	Emerging Test Techniques Common to High Temperature Superconducting (HTS) Power Applications		SD 1	Yes
7	WG	D1.39	Methods for Diagnostic/Failure Data Collection and Analysis		SD 2	Yes
8	WG	D1.40	Functional Nanomaterials for Electric Power Industry		SD 1	Yes
9	WG	D1.43	Rotating machine insulation voltage endurance under fast, repetitive voltage transients		SD 2	Yes
10	WG	D1.44	Testing of naturally polluted insulators		SD 2	Yes
11	JWG	D1.47	New Frontiers of Dissolved Gas Analysis (DGA) Interpretation for Power Transformers and their Accessories		SD 2	Yes
12	WG	D1.48	Properties of insulating materials under VLF voltages		SD 2	Yes
13	JWG	D1.49	Harmonised test for the measurement of residual inflammable gases in insulating materials by gas chromatography	8	SD 3	Yes
14	WG	D1.50	Atmospheric and altitude correction factors for air gaps and clean insulators	4	SD 1	Yes
15	WG	D1.51	Dielectric performance of eco-friendly gas insulated systems	7	SD 3	No
16	WG	D1.52	Moisture measurement in insulating fluids and transformer insulation – An evaluation of solid state sensors and chemical methods	8	SD 1	Yes
17	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
18	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
19	WG	D1.56	Field grading in electrical insulation systems	3	SD 1	Yes
20	JWG	D1.57	Dielectric Testing of Gas-insulated HVDC Systems	3	SD 1	No
21	WG	D1.58	Evaluation of dynamic hydrophobicity of polymeric insulating materials under AC and DC voltage stress	3	SD 1	Yes
22	WG	D1.59	Methods for dielectric characterisation of polymeric insulating materials for outdoor applications		SD 1	Yes
23	WG	D1.60	Traceable measurement techniques for very fast transients	6	SD 1	Yes
24	WG	D1.61	Optical corona detection and measurement		SD 2	Yes
25	WG	D1.62	Surface degradation of polymeric insulating materials for outdoor appl.		SD 2	Yes
26	WG	D1.63	Partial discharge detection under DC voltage stress	3	SD 1	Yes
27	WG	D1.64	Electrical insulation systems at cryogenic temperatures	9	SD 1	Yes
28	WG	D1.65	Mechanical properties of insulating materials and insulated conductors for oil insulated power transformers		SD 1	Yes

+ Technical Issues (cf. Electra 256 June 2011):
* Strategic Directions (cf. Electra 249 April 2010):
1 : The electrical power system of the future
2 : Making the best use of the existing power system
3 : Focus on the environment and sustainability
4 : Preparation of material readable for non technical audience