

CIGRE Study Committees D1 & A2

PROPOSAL FOR THE CREATION OF A NEW WORKING GROUP

JWG D1/A2.77	Name of Convenor: Fabio Scatiggio (IT)	
Strategic Directions #²: 2, 3		Sustainable Development Goal #³: 9
The WG applies to distribution networks: <input checked="" type="checkbox"/> Yes / <input type="checkbox"/> No		
Potential Benefit of WG work #⁴: 1 ,6		
Title of the Group: Liquid Tests for Electrical Equipment		
<p>Scope, deliverables and proposed time schedule of the WG:</p> <p>Background:</p> <p>Dissolved-Gas-Analysis (DGA) is indisputably the most important diagnostic tool for liquid-immersed transformers with about 1 million samples analyzed each year. In addition to dissolved gas analysis, liquid samples a wide range of other tests are made on liquid samples including furans and alcohols to detect solid insulation ageing and a range of chemical and physical tests on the liquid itself. Correlations between DGA results and results of the other tests have not been completely investigated.</p> <p>Statistical approaches have been applied in recent times, but results are sometimes unsatisfactory, due to there being many unknown variables (equipment type and service, age, liquid type and ageing, preservation systems, cooling systems, materials, sampling and measuring techniques, etc.). Better results can only be obtained through using a rigorous template for data collection.</p> <p>Scope:</p> <ol style="list-style-type: none"> 1. Verification of Ostwald coefficients, given large differences between values given in different standards 2. Improving interpretation models for natural and synthetic esters. 3. Recommend a data format or template for DGA and other liquid tests, with respect to transformer design and service data suited for data storage and exchange. 4. Providing guidance to differing gas levels/patterns in different transformer types i.e. small distribution transformers, wind & solar transformers, traction vs large power transformers. 5. Clustering of oil test results (DGA, furans, alcohols, chemical and physical tests) as function of the transformer age, type, liquid preservation system, etc. 6. Investigate, based on real failure cases, if different DGA interpretation criteria (Rogers, IEC, IEEE, Duval, etc.) lead to the same conclusion 7. Verification of new DGA detectors (helium, NDIR, PAS) not in accordance with existing standards. 		

Deliverables:

- Technical Brochure and Executive Summary in Electra
- Electra Report
- Future Connections
- CSE
- Tutorial
- Webinar

Time Schedule: start: March 2020

Final Report: February 2023

Approval by Technical Council Chairman:

Date: March 24th, 2020



Notes: ¹ Working Group (WG) or Joint WG (JWG), ² See attached Table 1, ³ See attached Table 2 and CIGRE reference Paper: Sustainability – at the heart of CIGRE's work. ⁴ See attached Table 3

Table 1: Strategic directions of the Technical Council

1	The electrical power system of the future reinforcing the End-to-End nature of CIGRE: respond to speed of changes in the industry by preparing and disseminating state-of-the-art technological advances
2	Making the best use of the existing systems
3	Focus on the environment and sustainability (in case the WG shows a direct contribution to at least one SDG)
4	Preparation of material readable for non-technical audience

Table 2: Environmental requirements and sustainable development goals

	CIGRE selected the 7 SDGs that are the most relevant to CIGRE. In case the WG work refers to other SDGs or do not address any specific SDG, it will be quoted 0.
0	Other SDGs or not applied
7	SDG 7: Affordable and clean energy Increase share of renewable energy; e.g. expand infrastructure for supplying sustainable energy services; ensure universal access to affordable, reliable, and modern energy services; energy efficiency; facilitate access to clean energy research and technology
9	SDG 9: Industry, innovation and infrastructure Facilitate sustainable infrastructure development; facilitate technological and technical support
11	SDG 11: Sustainable cities and communities Increase attention on sustainable and resilient buildings utilizing local (raw) materials, power for electric vehicles, strengthening long-line transmission and distribution systems to import necessary power to cities, developing micro-grids to reinforce the sustainable nature of cities; protect and safeguard the world's cultural and natural heritage; reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and waste management
12	SDG 12: Responsible consumption and production E.g. Promote public procurement practices that are sustainable; address reducing use of SF6 and promote alternatives, encourage companies to adopt sustainable practices and to integrate sustainability information into their reporting cycle, address inefficient fossil-fuel subsidies that encourage wasteful consumption
13	SDG 13: Climate action E.g. Increase share of renewable or other CO ₂ -free energy; energy efficiency; expand infrastructure for supplying sustainable energy; strengthen resilience and adaptive capacity to climate-related hazards and natural disasters; integrate climate change measures into national policies, strategies and planning; improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning
14	SDG 14: Life below water E.g. Effects of offshore windfarms; effects of submarine cables on sea-life
15	SDG 15: Life on land E.g. Attention for vegetation management; bird collisions; integration of substations and lines into the landscape

Table 3: Potential benefit of work

1	Commercial, business, social and economic benefits for industry or the community can be identified as a direct result of this work
2	Existing or future high interest in the work from a wide range of stakeholders
3	Work is likely to contribute to new or revised industry standards or with other long term interest for the Electric Power Industry
4	State-of-the-art or innovative solutions or new technical directions
5	Guide or survey related to existing techniques; or an update on past work or previous Technical Brochures
6	Work likely to contribute to improved safety.