


CIGRE Study Committee A2

PROPOSAL FOR THE CREATION OF A NEW WORKING GROUP (1)

JWG* N° A2.54	Name of Convener : Christoph Ploetner (DE) E-mail address: christoph.ploetner@de.abb.com
Technical Issues # (2): 8	Strategic Directions #(3): 1, 3
The WG applies to distribution networks (4): Yes	
Title of the Group: Power transformer audible sound requirements	
Scope, deliverables and proposed time schedule of the Group:	
Context International standards such as IEEE Std C57.12.90 "Standard Test Code for Liquid-Immersed Distribution, Power, and Regulating Transformers" and IEC 60076-10 "Power transformers – Part 10: Determination of sound levels" define very well the measurement of audible sound emission and how to determine the sound power level of power transformers during acceptance testing from there. The transformer industry is however suffering from not having reference / guidance on typical transformer sound level ranges and this repeatedly results in technically unreasonable sound level specifications. Sound levels are frequently specified unnecessary high but more recently often also too low in order to technically fulfill them without external sound mitigation means such as sound panels or sound enclosures. One of the rare documents in that area is a US standard of the National Electrical Manufacturing Association (NEMA), named No. TR1-1993 (R2000). Other documents are EN 4871, VDI 3739 and EN-50464-1. All those documents are either internationally not recognized and / or are known as being not up-to-date. Further, IEC TC14 expressed to SC A2 the need of some pre-standardization work in that area for transformers. Recently, WG A2.48 "Technologies and utilization of Shunt Reactors" studied and proposed ranges for reference sound levels of Shunt Reactors and this work set-up may be used as a good base for likewise studies on power transformers.	
Scope <ul style="list-style-type: none">• Units to be considered: distribution and power transformers with S = 10 kVA ...1500 MVA.• Description of basic sound development mechanisms - distinguish between no-load and load condition and cooling system. Describe techniques on how to combine these components.• Define a minimum of necessary transformer classes with respect to sound level development.• Development of sound level ranges for all three components per transformer class.• Distinction between 1Θ and 3Θ units and 50Hz / 60Hz units• Study and provide information on sound level legislation in different countries and compare with technical findings.• Summary information on sound mitigation (mounting, panels, enclosures, walls around units)	
Deliverables/time schedule The work will be finalized with a brochure, a workshop and a short report in Electra: <ul style="list-style-type: none">• Fall of 2015: Starting of the working group• End of 2017: Interim Report• August 2019: Final Report (Brochure)	
Comments from Chairmen of SC concerned:	
Approval by Technical Committee Chairmar. Date : 09/10/2015 	

(1) Joint Working Group (JWG) - (2) See attached table 1 – (3) See attached table 2
(4) Delete as appropriate

Table 1: Technical Issues of the TC project "Network of the Future" (cf. Electra 256 June 2011)

1	Active Distribution Networks resulting in bidirectional flows within distribution level and to the upstream network.
2	The application of advanced metering and resulting massive need for exchange of information.
3	The growth in the application of HVDC and power electronics at all voltage levels and its impact on power quality, system control, and system security, and standardisation.
4	The need for the development and massive installation of energy storage systems, and the impact this can have on the power system development and operation.
5	New concepts for system operation and control to take account of active customer interactions and different generation types.
6	New concepts for protection to respond to the developing grid and different characteristics of generation.
7	New concepts in planning to take into account increasing environmental constraints, and new technology solutions for active and reactive power flow control.
8	New tools for system technical performance assessment, because of new Customer, Generator and Network characteristics.
9	Increase of right of way capacity and use of overhead, underground and subsea infrastructure, and its consequence on the technical performance and reliability of the network.
10	An increasing need for keeping Stakeholders aware of the technical and commercial consequences and keeping them engaged during the development of the network of the future.

Table 2: Strategic directions of the TC (cf. Electra 249 April 2010)

1	The electrical power system of the future
2	Making the best use of the existing system
3	Focus on the environment and sustainability
4	Preparation of material readable for non-technical audience