

CIGRE Study committee A2

PROPOSAL FOR THE CREATION OF A NEW WORKING GROUP

WG A2.81

NAME OF THE CONVENOR

BOONEN Werner (BELGIUM)

TITLE

Guide for Power Transformer Design Review

THE WG APPLIES TO DISTRIBUTION NETWORKS: YES

ENERGY TRANSITION

- 1 / Storage
- 6 / Solar PV and Wind

POTENTIAL BENEFIT OF WG WORK

- 1 / commercial, business, social, economic benefits
- 2 / potential interest from a wide range of stakeholders
- 5 / Guide or survey on techniques, or updates on past work or brochures
- 6 / work likely to contribute to improve safety

STRATEGIC DIRECTION

- 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
- 3 / Focus of the environment and sustainability (in case the WG shows a direct contribution to at least one SDG)

SUSTAINABLE DEVELOPMENT GOAL

- 7 / Affordable and clean energy
- 9 / Industry, innovation and infrastructure

BACKGROUND :

There is increased demand for transformers Worldwide as a result of the Energy Transition. This has resulted in an increase in costs and delivery times. Many users are now having to purchase from unfamiliar suppliers to meet their needs. Integrating new transformer suppliers is an increasingly high priority for users Worldwide.

CIGRE previously studied this subject as part of WG A2.36, who published a brochure called "Guidelines for conducting design reviews for power transformers" as TB 529 in April 2013. Slightly updated material from this brochure was included in the Green Book on the transformer procurement process, published in September 2022.

PURPOSE / OBJECTIVE / BENEFIT OF THIS WORK :

There is now a need for a comprehensive update to TB 529. The main aim of the update is to take into account changes in user expectations and requirements (e.g. for special applications for renewables) arising from the Energy Transition. The update should take into account changes and improvements in industry practice since the original TB was published, including the development of new design concepts, more powerful design IT tools, new manufacturing methods, new test methods, and increased expectations concerning environmental, health, and safety management.

The main focus of TB 529 was on transformers with rated power of 100MVA and larger, and with rated voltage of 245kV class and above. The updated brochure will include a wider range of small and medium power transformers, in keeping with CIGRE's end-to-end mission and also with increased user demand for small and medium power transformers for the Energy Transition.

SCOPE :

The scope of the working group will be to develop a guide for performing design reviews of power transformers for the Energy Transition. This will include power transformers from 2.5MVA and higher and from 12kV class and higher. This will also include shunt reactors, which are increasingly in demand for the Energy Transition.

For each aspect of the design, customers may have various requirements regarding the scope and the level of detail expected in the documentation from the supplier. Due to the workforce challenges in the industry, and the increasing demand due to the Energy Transition, it is beneficial to have, from the start, a clear understanding of the customer expectations and requirements.

The goal is to increase the mutual understanding between suppliers and customers and to make the design review process more efficient and effective.

The working group will consider the following main aspects of transformer design:

- Core and winding assembly, electrical design
 - Tank, mechanical design
 - Controls and protection, low voltage design / accessories / digital integration
 - All interactions between the above aspects
 - All interactions with the customer’s network, substations and other relevant aspects like sustainability, regulations, safety, special applications, ...
 - FAT and quality requirement, from design to installation and commissioning
 - Schedules, preferably easy to use and adapt to the scope of review, to increase efficiency of the review process.
- Note: standardised distribution transformers up to 2.5MVA are not included in the scope of the working group.

Remarks:

The work will directly not affect any existing IEC standards. If gaps in standardization are identified during the work, recommendation could be made based on the findings.

DELIVERABLES AND EVENTS

Deliverables Types

Annual progress and activity report to Study Committee
Electra report
Technical Brochure and Executive Summary in Electra
Tutorial
Webinar

Time schedule

Q4	2025	Recruit members (National Committees, WiE, NGN)
Q1	2026	Develop final work plan
Q1	2028	Draft Technical Brochure for Study Committee review
Q3	2028	Final draft Technical Brochure
Q3	2028	Tutorial
Q3	2028	Webinar

APPROVAL BY TECHNICAL COUNCIL CHAIRMAN:

Rannveig S. J. Loken
October 20th, 2025