CIGRE Study committe B1

PROPOSAL FOR THE CREATION OF A NEW WORKING GROUP

WG B1.94

NAME OF THE CONVENOR
Van Der Wielen Peter (NETHERLANDS)

TITLE
Impact of the energy transition, including increased switching and load changes, on the reliability of AC cable systems

THE WG APPLIES TO DISTRIBUTION NETWORKS: NO

ENERGY TRANSITION
5 / Grids and Flexibility

POTENTIAL BENEFIT OF WG WORK
2 / potential interest from a wide range of stakeholders
3 / likely to contribute to new or revised industry standards

STRATEGIC DIRECTION
2 / Making the best use of the existing systems

SUSTAINABLE DEVELOPMENT GOAL
9 / Industry, innovation and infrastructure

BACKGROUND :
The energy transition is changing how transmission and distribution systems operate, with more renewables, new loads (like EV chargers, capacitor banks and data centres), and longer cable connections.
This leads to higher average loading, more load variation, and increased switching operations, causing phenomena such as:

- Slow front over-voltages in long cables
- Higher harmonics from power electronics
- Transients from switching (especially GIS)
- Higher cable loading and more extreme load fluctuations

Understanding these effects is crucial to avoid reduced reliability or accelerated ageing of both new and existing cable systems.

PURPOSE / OBJECTIVE / BENEFIT OF THIS WORK :
Recommend establishing a Working Group (WG) to address the impact of the energy transition on cable system reliability.

Gather and analyse global data on failures linked to changes in grid operation and configuration.

Provide guidance for research, testing, and operational improvements to mitigate new risks.

SCOPE :
Inventory actual and suspected failures related to energy transition-driven grid changes, including certainty of links.

Expand the inquiry with additional relevant questions.

Review literature and theory to map possible relations between operational changes and cable failures.

Recommend improvements for research programs, testing (e.g., switching operations, earth screen connections), and quality assurance.

Advise on operational conditions, such as the number of switching operations.

Focus exclusively on AC cable systems (exclude DC).

Cover both (E)HV and MV systems, with emphasis on (E)HV.

DELIVERABLES AND EVENTS

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

Time schedule

Q1	2026	Recruit members
Q2	2026	Develop workplan
Q1	2028	Draft TB for SC review
Q1	2028	Approved Tutorial
Q1	2028	Final TB for publication

APPROVAL BY TECHNICAL COUNCIL CHAIRMAN:
Rannveig S. J. Loken
January 19th, 2026