

CIGRE Study committee A1

PROPOSAL FOR THE CREATION OF A NEW WORKING GROUP

WG A1.80

NAME OF THE CONVENOR

Singh Sunjesh (SOUTH AFRICA)

TITLE

Technical Guide for Visual Inspection of Stator Windings and Cores in Large Turbo Generators during Rewinds and Maintenance

THE WG APPLIES TO DISTRIBUTION NETWORKS: NO

ENERGY TRANSITION

0 / Not applied

POTENTIAL BENEFIT OF WG WORK

5 / Guide or survey on techniques, or updates on past work or brochures

STRATEGIC DIRECTION

2 / Making the best use of the existing systems

SUSTAINABLE DEVELOPMENT GOAL

9 / Industry, innovation and infrastructure

BACKGROUND :

The global increase in electrical energy demand requires that large power plants achieve both high availability and maximum productivity. Operating these critical assets at peak performance while extending their life expectancy creates complex reliability challenges, particularly for aging plant. Standard maintenance strategies are often insufficient to address the unique degradation modes associated with the advanced insulation and core systems found in large turbo generators.

The transition of a generator into a major repair phase, such as a stator rewind, represents a period of extreme technical risk. During these works, the machine is susceptible to Foreign Object Debris (FOD), contamination of slots, and damage to delicate core laminations. Experience shows that unless inspections are carried out at predetermined stages such as prior to, during, and after bar installation preventing significant defects can be overlooked. These include compromised stator temperature sensors, loose ripple springs, or arcing between key bars and laminations at the "back of core".

Because no single work instruction can cover every repair eventuality, there is a global need for a standardized methodology to develop site-specific procedures for these complex inspections.

PURPOSE / OBJECTIVE / BENEFIT OF THIS WORK :

The primary purpose of this Working Group will be to establish a global technical guide for the visual inspection of large turbo generators to ensure asset integrity and safe operational readiness. While general inspection guides exist, this work focuses specifically on the technical complexities encountered during high-risk lifecycle events such as major maintenance and stator rewinds.

It aims to bridge technical gaps by providing specific criteria for specialized components, such as stator thermocouples, "back of core" laminations, and Teflon cooling hoses. Additionally, the group will address the human factor by developing itemized check-sheet templates and protocols designed to mitigate inspection fatigue.

SCOPE :

This Working Group will focus on the technical execution of visual inspections for Large Turbo Generators. In a

stator rewind, process control establishes rigorous protocols for slot cleanliness, the installation of bars and polymerization, and the verification of embedded sensors.

Regarding core and casing integrity, the scope includes detailed axial and circumferential assessments to detect bent laminations or damaged I-beams, alongside specialized evaluations of "back of core" conditions and key bar arcing. The WG will standardize inspections of end-winding and support structures, targeting the mechanical integrity of bracing, H-blocking, support blocks, and circular phase connections to ensure overall machine reliability.

DELIVERABLES AND EVENTS

Deliverables Types

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

Time schedule

- | | | |
|----|------|-------------------------------------|
| Q4 | 2026 | Recruit members |
| Q2 | 2027 | Develop work plan |
| Q1 | 2028 | Draft TB for Study Committee review |
| Q4 | 2028 | Finalize TB |
| Q2 | 2029 | Tutorial |
| Q2 | 2029 | Webinar |

APPROVAL BY TECHNICAL COUNCIL CHAIRMAN:

Rannveig S. J. Loken
October 16th, 2026