

CIGRE Study Committee B2/B1

PROPOSAL FOR THE CREATION OF A NEW WORKING GROUP

JWG B2/B1.90	Name of Convenor: Antonio Useros (SPAIN)																	
Strategic Directions #²: 1, 3		Sustainable Development Goal #³: 7, 9, 11, 15																
<p>This Working Group addresses these Energy Transition topics:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;"><input type="checkbox"/> Storage</td> <td style="width: 50%; border: none;"><input type="checkbox"/> None of them</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Hydrogen</td> <td></td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Digitalization</td> <td></td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Sustainability and Climate Change</td> <td></td> </tr> <tr> <td style="border: none;"><input checked="" type="checkbox"/> Grids and Flexibility</td> <td></td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Solar PV and Wind</td> <td></td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Consumers, Prosumers and Electrical Vehicles</td> <td></td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Sector Integration</td> <td></td> </tr> </table>			<input type="checkbox"/> Storage	<input type="checkbox"/> None of them	<input type="checkbox"/> Hydrogen		<input type="checkbox"/> Digitalization		<input type="checkbox"/> Sustainability and Climate Change		<input checked="" type="checkbox"/> Grids and Flexibility		<input type="checkbox"/> Solar PV and Wind		<input type="checkbox"/> Consumers, Prosumers and Electrical Vehicles		<input type="checkbox"/> Sector Integration	
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Potential Benefit of WG work #⁴: 2, 5, 6																		
Title of the Group: Transition facilities between overhead and underground lines																		
<p>Scope, deliverables and proposed time schedule of the WG:</p> <p>Background:</p> <p>Completely overhead transmission and distribution lines are becoming less common.</p> <p>Many of the new network developments include underground sections to make the grids compatible with special environmental requests and social demands, on closed urban areas and their growth, and other facilities; to get the permits for the use of new right of ways; to facilitate their connection to gas insulated substations, etc.</p> <p>On the other hand, modifications of the existing networks to underground one or more sections of their overhead circuits are also quite frequent, since grid owners must adapt and make them compatible with other developments, land uses and special social claims and needs.</p> <p>These mixed lines (overhead and underground) have a particular component which deserves special attention: the transition facility.</p> <p>These transition facilities are the meeting point of two network realms, overhead lines and underground cables, which many times suffer from a lack of coordination, making it very advisable to create a joint working group to put in common the expertise of these two fields for the sake of a good design, construction, maintenance, and operation of the line transition facilities.</p> <p>Besides that, it would be an excellent starting point for those utilities which are not used to these transitions facilities and will have to build them in the near future, taking advantage of the existing knowledge and experience that will be shared in the proposed joint working group.</p>																		

Scope:

1. Design

- General facility layout, location of terminals, surge arresters and ground boxes.
- Overhead – Underground connection and structures – accessories interphase.
- Electrical issues: clearances, grounding, and insulation coordination.
- Mechanical issues: ancillary components loads.
- Thermal issues: hot spots.
- Sheath cable earthing: recommendations.
- Low voltage energy supply.
- Transition facilities main cost drivers.
- Transition facilities examples.

2. Construction

- Access to the site (specially for cable drums).
- Cable stringing and protection.
- Accessories making procedure.
- Telecommunications installation.
- Materials: who delivers what?
- Installation: who does what?
- Commissioning tests.

3. Environmental, social and safety issues

- Criteria to select the best (or less bad) location for the transition facility.
- Induced voltages and currents from crossing lines/cables.
- Visual impact.
- EMF, corona effect and noise.
- Safety for the people (explosions, fires).
- Safety for the facility.

4. Maintenance

- Maintenance needs.
- Predictive maintenance and monitoring.
- Restoration time.
- Spare parts.
- Sabotages.
- Thefts.

5. Network operation

- System or line perspective.
- Power capacity (nominal and during overloads).
- Protections: reclosing, fault location.
- Reactive compensation.

This working group will encompass design, construction and environmental, social and safety issues, leaving maintenance and network operation for a subsequent working group

that will start once this has finished. It will take into consideration inputs not only from study committees B1 (Insulated cables) and B2 (Overhead lines) but also from study committees B3 (Substations and electrical installations) and C4 (Power system technical performance), gathering the topics 1, 2 and 3 in a technical brochure that will contain a detailed description of the transition facilities from a comprehensive point of view, best practices, recommendations, experiences, examples of real facilities and references.

Deliverables:

- Annual Progress and Activity Report to Study Committee
- Technical Brochure and Executive Summary in Electra
- Electra Report
- Future Connections
- CIGRE Science & Engineering (CSE) Journal
- Tutorial
- Webinar

Time Schedule:

- Recruit members (National Committees, WiE, NGN) Q4 0 2023
- Develop final work plan Q1 0 2024
- Draft TB for Study Committee Review Q2 0 2026
- Final TB Q4 0 2026
- Tutorial Q2 0 2027

Approval by Technical Council Chair:

Date: February 5th, 2024



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

WG Membership: refer Comments at end of document

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.

Comments:

1) CIGRE Official Study Committee Rules: WG Membership

<https://www.cigre.org/GB/about/official-documents>

- a. Only one member per country: by exception of SC Chair, WiE and NGN nominees.
- b. WG nominees by NCs must first be supported by their National Committee (or local SC Member) as an appropriate representative of their country.
- c. Acceptance of the nomination is granted by the SC Chair and advised to the WG Convener.

2) Collaboration Space

<https://www.cigre.org/article/GB/collaborative-tools-2>

CIGRE will provision the WG with a dedicated Knowledge Management System Space.

The WG will use the KMS for drafting collaboration, capture and retention of discussion and meeting records.

Official country WG Members will be sent registration instructions by the Convener.

Official country WG Members may request the WG Convener to allow additional access for an extra national subject matter specialist to aid in the work at the national level, including NGN members.