

CIGRE Study Committee B3

PROPOSAL FOR THE CREATION OF A NEW WORKING GROUP

WG¹ B3.68	Name of Convenor: Simon WADDINGTON (UK)																
Strategic Directions #²: 1, 2	Sustainable Development Goal #³: 7, 9																
<p>This Working Group addresses these Energy Transition topics:</p> <table border="0"> <tr> <td><input type="checkbox"/> Storage</td> <td><input type="checkbox"/> None of them</td> </tr> <tr> <td><input type="checkbox"/> Hydrogen</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Digitalization</td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/> Sustainability and Climate Change</td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/> Grids and Flexibility</td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/> Solar PV and Wind</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Consumers, Prosumers and Electrical Vehicles</td> <td></td> </tr> <tr> <td><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 checked="" type="checkbox"/> Sustainability and Climate Change		<input checked="" type="checkbox"/> Grids and Flexibility		<input checked="" 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: 3, 5, 6																	
Title of the Group: Experience of Offshore Substation (OSS) operation and maintenance																	
<p>Scope, deliverables, and proposed schedule of the WG:</p> <p>Background:</p> <p>It is over 20 years since the first offshore substation (OSS) was commissioned, and since then more than 200 AC & DC offshore facilities have been commissioned worldwide.</p> <p>Despite the existence of specific standards like DNV-ST-0145, which provides guidelines for the design and construction of offshore substations, there is still no comprehensive international standard (IEC, ISO, or otherwise) that addresses all the very specific technical issues in this area. Although the sector is still growing and there is significant operational experience to report on, access to this valuable experience remains very limited.</p> <p>Purpose/Objective/Benefit of this work:</p> <p>The Working Group is to produce a technical brochure which synthesises the technical knowledge and experience of all stakeholders regarding the life-cycle issues associated with these offshore facilities. The hope is this will underpin any future establishment of international standards and guidance (ISO or IEC document suite).</p> <p>Scope:</p> <p>Review of Technical Brochure 483; ‘<i>Guidelines for the Design & Construction of AC Offshore Substations for Wind Power Plants</i>’ and TB 612; ‘<i>Special Considerations for AC collector Substations associated with HVDC connected Wind Power Plants</i>’.</p> <p>International survey to gather feedback, experience and statistics on:</p> <ul style="list-style-type: none"> • System Boundaries – Limits of scope under review in a OWF • Scalability – OWF to Energy islands MW to GW 																	

- Design OSS Design and operational regulations (arising from National regulations)
- Design performance standards and risk-based maintenance
- Factors influencing the Solution Design Lifetime – (e.g. corrosion, erosion, salt contamination)
- Hazard & risk management practices – e.g. Arc flash & operating in confined spaces
- Equipment selection, optimisation and interfacing (special treatments, etc.)
 - GIS (impact of environmental legislation for SF₆.)
 - Main transformers (cooling, winding arrangement/earthing, OLTP, bushings)
 - Auxiliary equipment (HVAC, Gensets, etc.),
- Infrastructure design
 - Containerised and bespoke layouts
 - Foundation dynamics
- Maintenance & asset management strategies
 - Simplification of Design to lower facilitate maintenance burden,
 - O&M strategy (unmanned vs manned, living quarter vs SOV, etc.),
 - Maintenance planning and optimization, maintenance activity list,
 - OPEX planning in design stage
 - Effectiveness of different regimes and impact on availability, remote monitoring best practices
- Operational experience (review of activities, valuable learning points)
 - Resource profiles, access to OSS, requisite skills, training & certification.
- Operational availability statistics (including a focus on corrosion-related faults).
- Equipment intervention and decommissioning experiences.
- Fire Risk Assessment methodologies, incidents, consequences and prevention
- Operational risk, fiscal, environmental, and safety – a review of hazards and safeguards
- Offshore Substation Safety Case, performance standards, and further work

Remarks: These are at the point of writing in no specific order, they will be logically and chronologically ordered. Study Committee B1 (Insulated Cables) will be contacted to offer some participation in this Working Group.

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) Qtr 3 2024
- Develop final work plan Qtr 4 2024

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|---------------------------------------|------------|
| • Draft TB for Study Committee Review | Qtr 2 2027 |
| • Final TB | Qtr 3 2027 |
| • Tutorial | Qtr 4 2027 |
| • Webinar | Qtr 1 2028 |

Approval by Technical Council Chair:

Date: July 30th, 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.