

Report to the CIGRE Australian Technical Council

Study Committee SC B3 and Australian Panel AU B3 Activities

Presented by Daniel Stafford



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AU Panel B3 Report 2025

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For power system expertise

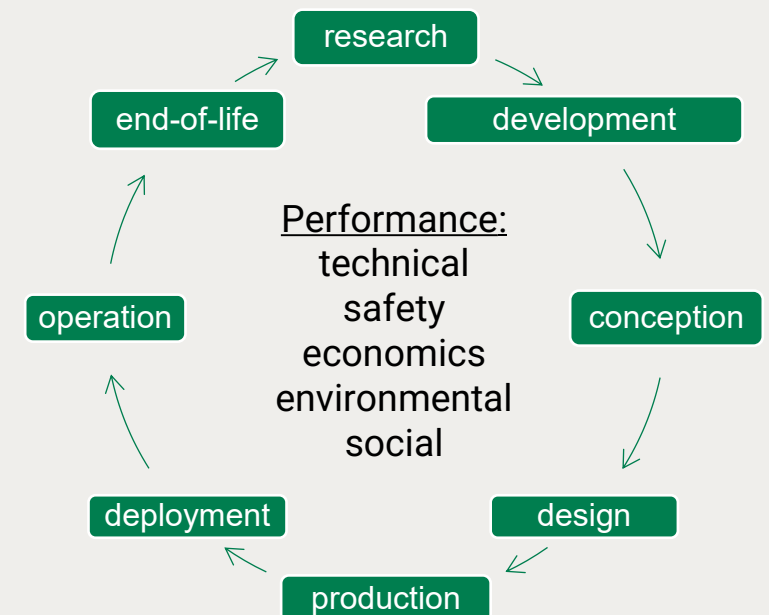
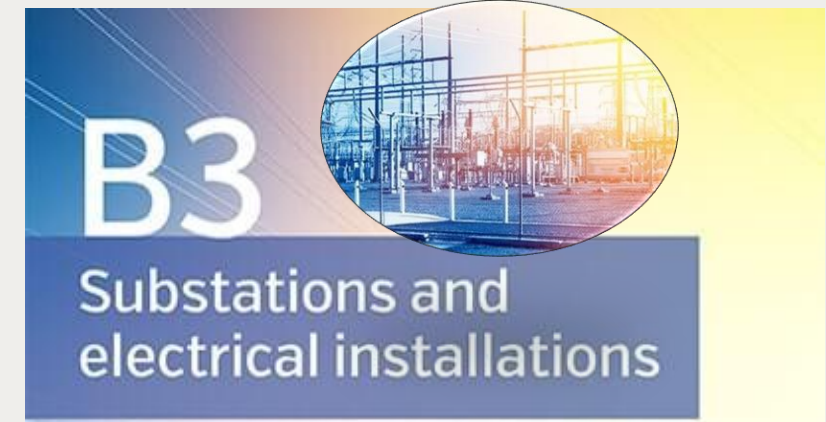
B3

Substations and
electrical installations



Study Committee (SC) B3 THEMES

- Scope:
 - all phases of the substation lifetime
 - all aspects of performance
 - particular emphasis on the impact of changing interactions and requirements due to the evolution of the power system.
 - Life cycle assessment techniques, risk management techniques, education and training are also important aspects.
- Preferential Subjects 2024-2026:
 - Innovative Concepts, Designs and Operation Experience in Substations
 - Life Cycle & Asset Management in Substations
 - Impacts of Grid Transformation and New Reliability Threats in Substations



SC B3 KEY FOCUS AREAS



- 4 Working areas
- currently 17 Working Groups and 1 special project:
 - 12 WGs (B3 only)
 - 6 joint WGs, led by B3
 - SF₆ Greenbook

Working Areas: AA1 Substation Concepts and Development Advisor: Mark Osborne	AA2 Gas Insulated Substations Advisor: Mark Kuschel	AA3 Air Insulated Substation Advisor: Shinki Noguchi	AA4 Substation Management & Digital Integration Advisor: Johan Smit
B3.52 Neutral Grounding Mode Selection and Fault Handling for Substation in Distribution Grid	JWG B3/A3.60 User guide for non-SF6 gases and gas mixtures in Substations	B3.64 Guidelines on Optimizing Seismic Design of Substations for Power Resiliency	B3.56 Application of 3D Technologies in Substation Engineering Works
B3.54 Earthing System Test Methods	JWG B3/D1.63 Guideline for assessing the toxicity of used SF6 gas onsite and in the lab of T&D equipment above 1 kV in substations	B3.69 Process Requirements for Commissioning and Inspection of Air Insulated Substations (AIS) and Gas Insulated Substations (GIS)	B3.61 Risk and asset health-based decision making in existing substations
B3.65 Guidelines for the Selection and Design of escape routes for substations rated above 1kV AC and 1.5 kV DC	JWG B3/A3.67 Operational safety of Medium Voltage GIS in case of abnormal leakage	B3.70 Guidelines for the Use of Advanced Technologies for Information and Knowledge Management in Substations	B3.72 Integration of asset information in modern substations for (asset) management of substation equipment
B3.68 Experience of Offshore Substation (OSS) operation and maintenance	Greenbook Project 2 - SF6 Guidebook		B3.73 Asset management and digital integration of mobile substations for a resilient and flexible transmission grid
B3.71 Substations Improvements to Black Start Capability			JWG B3/D2.62 Life-long Supervision and Management of Substations by use of Sensors, Mobile Devices, Information and Communication
			JWG B3/A2/A3/C3/D1.66 Guidelines for Life Cycle Assessment in Substations considering the carbon footprint evaluation

Legend:

B3 WG	Joint WG led by B3
Special project	new WG approved in 2025

SC B3 MAJOR ACHIEVEMENTS



- Three new Technical Brochures published:
 - **930** Review of Substation busbar component reliability (WG B3.49)
 - **945** Recommendations for a Performance Guideline of Solid Insulated Busbar Systems (JWG B1/B3.74)
 - **957** Recommendations for dielectric testing of HVDC gas-insulated cable connection assemblies (JWG B1/B3/D1.79)
- Six tutorials delivered:
 - **914** Guidelines for SF6 end-of-life treatment of T&D equipment (-1kV) in Substations
 - **tbc** User Guide for Non-SF6 Gases and Gas Mixtures in Substations
 - **907** Mobile substations incorporating HV GIS
 - **930** Review of Substation Busbar Component Reliability
 - **886** Guidelines for Fire Risk Management in Substations
 - **869** Design guideline for substations connecting battery energy storage solutions (BESS)

SC B3 Working Group NEW MEMBERS Required



WG #	Status	Start Year	Title (ToR)	Convener	AU/NZ Member
B3.73	active	2025	Asset management and digital integration of mobile substations for a resilient and flexible transmission grid	Peter Vaessen	@ Joseph PINHEIRO 
B3.72	proposed	2025	Integration of asset information in modern substations for (asset) management of substation equipment	@ Jan BEDNARIK	
B3.71	pending approval	2025	Substations Improvements to support Black Start Capability	@ Crina COSTAN	@ Crina COSTAN 
B3.70	active	2025	Use of Advanced Technologies for Information and Knowledge Management in Substations	Okada Akira	@ Crina COSTAN (Secretary) @ Senthil kumar ARUMUGAM 
B3.69	active	2025	Process Requirements for Commissioning and Inspection of AIS Substations and GIS Substations	@ George BECKER	• Dimuthu WIJEWICKRAMA (Western Power) for AU • Ishan Jayasekara (Transpower) for NZ 

Australian Panel B3 Annual Meeting 2025

- 16-17 October 2025 in Darwin, hosted by Power Water
- 33 Members, 6 Observers and 3 Guest Speakers:
 - Stuart Eassie (PowerWater): Substation Design – from the conventional to contemporary
 - Prof. Alex Baitch: The Journey of AS2067 and future developments
 - Dr Darren Woodhouse: The technical issues of Transformer Earthing and Neutral Earthing
- >10 Members' technical presentations



Australian Panel B3 MAJOR ACHIEVEMENTS

- 2 technical e-seminars with a wide range of contributions by members
- 1 two-day Annual Meeting & Panel Dinner (Darwin)
- 2 AP.B3 members at Montreal Symposium with 1 Paper presented by the AP.B3 Convenor
- One active Task Force (oil/water separators & fire risk) preparing a position paper
- Strong presence in international WGs: presently 12 members in active WGs
- 8 (!) abstracts submitted for the Paris 2026 Session
- Full implementation of KMS



Australian Panel B3 Outlook

- Two online technical seminars on focus topics (Q1 2026: 3D Design of substations)
- One hybrid meeting in Sydney/online (at the occasion of a planned SC.B3 meeting)
- Facilitation of contributions for the Paris 2026 Session
- Support AP.B3 members who are Paris 2026 Session paper authors
- Two-day annual meeting on 22-23 October 2026 in Wellington (NZ)
- Continue to
 - Maintain active membership on existing and new WGs
 - Provide comments on new WG Draft TORs and Draft TBs
 - Maintain an active relationship and dialogue with other Cigre panels and organisations



THANK YOU



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