

DISCUSSION MEETING

Study Committee B4

DC Systems and Power Electronics

28 August 2026

SUMMARY

Chair: Jingxuan (Joanne) Hu

Secretary: Rebecca Ostash

Special Reporters: Vajira Pathirana (Canada), Sebastien Denetiere (France), Taosha Jiang (China), Sid Parmar (USA) and Stephane Henrion (USA)

1. INTRODUCTION

The 2026 group discussion meeting (GDM) of Study Committee B4 was held on Friday 28th August in Grand Amphitheatre at the Palais des Congrès in a morning and afternoon session. The B4 chair opened the meeting with introduction of Study Committee B4 structure.

B4 GDM session was attended by approximately 200-250 in-person delegates. The 123 papers covered by Study Committee B4 during the 2026 CIGRE and the 22 questions prepared by special reporters Vajira Pathirana (Canada), Sebastien Denetiere (France), Taosha Jiang (China), Sid Parmar (USA) and Stephane Henrion (USA) in the special report were used as the basis for the questions and discussion. The discussion included 54 prepared contributions that were selected from 87 submitted contributions, two (2) invited presentations from CIGRE young (NGN) members (only one (1) NGN paper was actually presented at the GDM). Spontaneous contributions were encouraged by the Special Reporters, and as a result 35 spontaneous contributions were made. The large number of submitted contributions reflect the large interest in the preferential subjects and the area of HVDC and Power Electronics in general.

2. RUNNING OF THE MEETING

The Discussion Group Meeting was chaired by the Study Committee Chairman, *Joanne Hu*, with *Vajira Pathirana (Canada)*, *Sebastien Denetiere (France)*, *Taosha Jiang (China)*, *Sid Parmar (USA)* and *Stephane Henrion (USA)* as Special Reporters and *Rebecca Ostash* as SC B4 Secretary.

Three preferential subjects were covered in the Technical Session:

PS 1 DC Equipment and Systems

- PS1.1: Planning, design, performance, testing and commissioning of DC equipment and systems including point to point, multiterminal and DC grids, especially offshore DC systems.
 - PS1.1-1: LCC & Hybrid HVDC
 - PS1.1-2: VSC HVDC
 - PS1.1-3: Offshore HVDC
 - PS1.1-4: Multi-Terminal & DC Grids
- PS1.2: Refurbishment and upgrade of existing DC systems.
- PS1.3: Service and operating experience of DC converter stations and systems, especially VSC based DC systems and offshore DC systems.
 - PS1.3-1: Reliability Assessment
 - PS1.3-2: Insulation Performance
 - PS1.3-3: Operational Experience
 - PS1.3-4: Maintenance Experience
 - PS1.3-5: Digitalization, Monitoring, and Digital Twin Applications

PS 2 FACTS and Power Electronics

- PS2.1: Planning, design, performance, testing and commissioning of FACTS and other PE devices including inverter-based generation.
 - PS2.1-2: STATCOM & SVC
 - PS2.1-2: Other Power Electronic Devices
- PS2.2: Refurbishment and upgrade of existing FACTS and other PE devices.
- PS2.3: Service and operating experience.

PS 3 New Technologies and Concepts of DC and FACTS Enabling Energy Transition

- PS3.1: New technologies/concepts to address network issues associated with green energy transition such as application of grid-forming converters, multi-vendor interoperability.
 - PS3.1-1: Modeling & Analysis
 - PS3.1-2: Network Integration & Application
- PS3.2: New Concepts, Technologies and design of DC converters and PE devices for both transmission and distribution systems including interfacing generation and storage to the network, energy hubs/islands, etc.
 - PS3.2-1: UHVDC Transmission System
 - PS3.2-2: Medium Voltage DC
 - PS3.2-3: DC Protection and DC Circuit Breakers
 - PS3.2-4: Grid Support, FACTS, and Digital Substations

These papers represent the latest information on many aspects of HVDC systems and FACTS schemes at various stages from planning, design, construction, testing to operation, including:

- HVDC Planning, Control, Protection, Operation, Design & Performance
- Grid Forming Controls & Applications
- UHVDC, Multi-GW
- Offshore HVDC
- Multi-Terminal HVDC Systems & DC grids, including protection and DC breakers
- HVDC Multi-Vendor Issues including Interoperability and IP Issues
- HVDC Refurbishment
- HVDC Lifecycle, O&M, Monitoring
- HVDC Statistics, Reliability Availability & Maintainability (RAM)
- HVDC operational experience
- MVDC Application
- Digital Twin

- Real Time Simulation & Testing
- STATCOM Applications, including GFM, E-STATCOMs and high rating STATCOMs
- Other FACTS Applications

The GDM meetings started at 9:00 am (CEST) with opening remarks from Joanne Hu and continued till 5:00 pm (CEST), with two 30-minute breaks and 1.5h-hour break for lunch.

3. CONTRIBUTIONS TO PREFERENTIAL SUBJECT 1

Seventy-one (71) papers were accepted in 2026 under the **PS1 subject**. There were twelve (12) questions raised in the special report for PS1 and total of fifty-four (54) contributions were received in response to these questions, with thirty-two (32) of these contributions being accepted. 22 spontaneous contributions were made at the GDM in response to these questions.

4. CONTRIBUTIONS TO PREFERENTIAL SUBJECT 1/2

Sixteen (16) papers were accepted in 2026 under the **PS1 subject**. There were three (3) questions raised in the special report for PS2 and total of ten (10) contributions were received in response to these questions, with seven (7) of these contributions being accepted. 2 spontaneous contributions were made at the GDM in response to these questions.

5. CONTRIBUTIONS TO PREFERENTIAL SUBJECT 3

Thirty-six (36) papers were accepted in 2026 under the **PS3 subject**. There were seven (7) questions raised in the special report for PS1 and total of twenty-three (23) contributions were received in response to these questions, with fifteen (15) of these contributions being accepted. 11 spontaneous contributions were made at the GDM in response to these questions.

6. CONCLUSION

The CIGRE 2026 Session was a highly successful event for Study Committee B4. The Group Discussion Meeting (GDM) featured 54 accepted contributions, selected from 87 submissions, together with two invited NGN presentations. One of the NGN presenters was able to attend the GDM and present their paper. In addition, 35 spontaneous contributions were received, demonstrating the strong engagement of the B4 community.

Due to the limited time available during the GDM, not all high-quality contributions could be selected for oral presentation. However, these contributions that were reviewed and accepted will be included in the Session proceedings, recognizing their technical quality and value.

DC systems and power electronics continues to be a topic of great interest and participation around the globe. CIGRE has an important role in further development of this technology by making a wealth of technical information available to the engineers around the world and by providing a forum for detailed technical discussions and exchange of experience. In this session, hot topics of contributions included Grid Forming, HVDC reliability/outages/refurbishments, Multi-terminal/Multi-vendor HVDC topics and AI data centers to name a few.

 [Video of the B4 Group Discussion Meeting](#)