

## **CIGRE–India Study Committee C2 Webinar – Special Report**

**Webinar on:** Grid-Forming Inverters and Possible Applications for the Indian Power System

**Organised by:** CIGRE India – Study Committee C2

**In collaboration with:** GRID-INDIA and Forum of Load Dispatchers (FOLD)

**Date & Time:** 10<sup>th</sup> January 2026 (Saturday) | [11:00 hrs – 13:00 hrs (IST)]

**Platform:** Virtual MS Teams

**Session Chair:** Sh. S.R. Narasimhan, Ex CMD, GRID-INDIA, Distinguished Member CIGRE

**No. of participants attended:** More than 200 (187 virtual participants together with teams joining from common place)

### **1. Background**

CIGRE India Study Committee C2 organised this webinar to deliberate on *Grid Forming Technology* with a focus on its relevance to Indian power system operation and control in the context of increasing renewable energy integration.

### **2. Inaugural & Opening Remarks**

**Sh. Vivek Pandey**, study committee C2 India chair welcomed participants and outlined the agenda. He informed that a discussion paper on the subject had been published and invited comments from the stakeholders.

**Shri R.K. Porwal**, Vice President, CIGRE-India & Director (SO), GRID-INDIA, emphasised the need to address emerging operational challenges with growing renewable penetration while ensuring grid security and reliability. He underscored the importance of collective learning and collaboration among various stakeholders and encouraged continued organisation of such timely technical webinars.

**Shri K.V.S. Baba**, Co-Chair, Technical Council, CIGRE India, observed that renewable integration has introduced issues related to system inertia, reactive power support, and black-start capability. He noted that grid-forming technologies are expected to play an important role in addressing these challenges

### **3. Technical Session**

Shri Vivek Pandey introduced technical session chair **Shri S.R. Narasimhan**, Ex CMD, GRID-INDIA, highlighting his experience & contributions in the domain.

Sh. Narasimhan noted that inverter-based resources are progressively replacing conventional generation, which traditionally provided essential services such as inertia, system damping, and black-start capability. He highlighted that several power systems, particularly small and islanded grids, are already operating with very high VRE penetration levels, necessitating provision of grid-essential services through advanced inverter technologies. He introduced the speakers of the webinar:

- **Shri Priyam Jain**, Chief Manager, NLDC, GRID-INDIA
- **Shri Gaurab Dash**, Deputy Manager, NLDC, GRID-INDIA

#### Key points covered:

- Renewable energy integration challenges in the Indian power system
- Fundamentals of grid-forming inverter technology
- Comparison between grid-forming and grid-following control philosophies
- Insights from RMS and EMT-based simulation studies
- International experience in deployment of grid-forming inverters
- Grid code and standardisation aspects relevant to India

## 4. Q&A and Key Takeaways

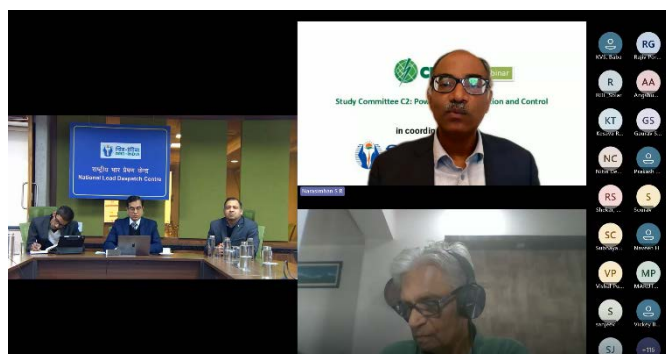
The session included an interactive Q&A with experts from industry and academia moderated by the Session Chair. Key takeaways include:

- Grid-forming inverter technology is expected to play a significant role in future low-inertia power systems.
- Detailed system studies and careful evaluation is important before large-scale deployment in the Indian grid. GFM technology may be considered for new BESS projects.
- Concurrent updates to standards and regulatory frameworks will be essential to enable adoption and subsequent incorporation in bid documents.

## 5. Conclusion

The Session Chair summarised the key discussions and emphasised the need for continued technical engagement under CIGRE India SC C2. Shri Vivek Pandey highlighted the Terms of Reference of the joint IEEE–CIGRE Task Force on the reassessment of power system stability definitions and classification of converter-dominated grids, and invited suggestions from all stakeholders.

### Photo Snips





**Webinar**

**Study Committee C2: Power System Operation and Control**

in coordination with

**ग्रीड-इंडिया GRID-INDIA**

**FOLD**

10 Jan 2026

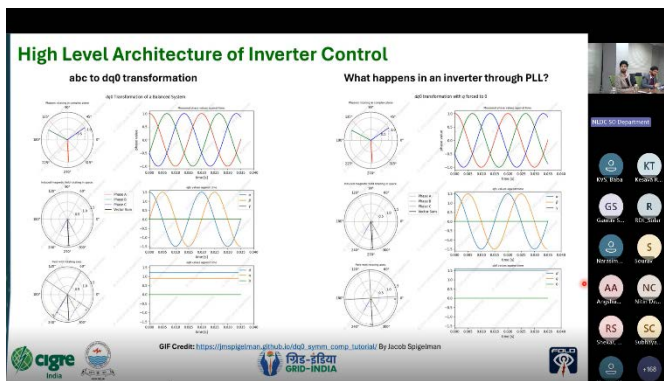


**Grid Forming Inverters and Possible Applications for Indian Power System**

**Presenters: Priyam Jain and Gaurab Dash**

**Other Core Team Members: Prabhankar Porwal, Raj Kishan, Arpan Saha and teams across NLDC/RLDCs**

**GRID CONTROLLER OF INDIA LIMITED**

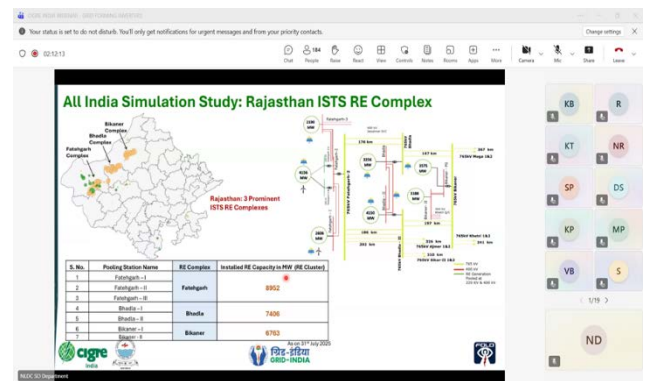


**High Level Architecture of Inverter Control**

abc to dq0 transformation

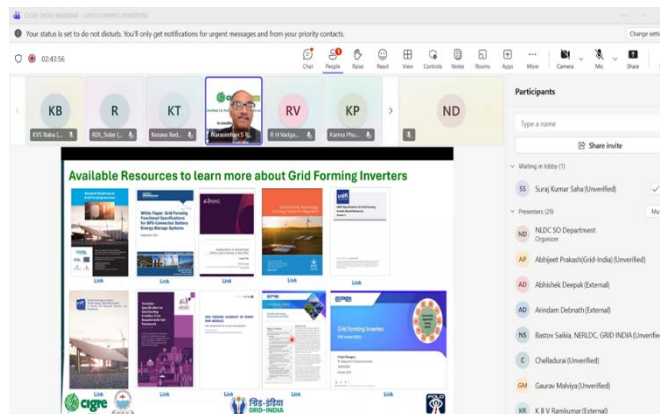
What happens in an inverter through PLL?

Grid Credit: [https://imgaiman.github.io/dq0\\_symm\\_comp\\_tutorial/](https://imgaiman.github.io/dq0_symm_comp_tutorial/) By Jacob Spiegelman



**All India Simulation Study: Rajasthan ISTS RE Complex**

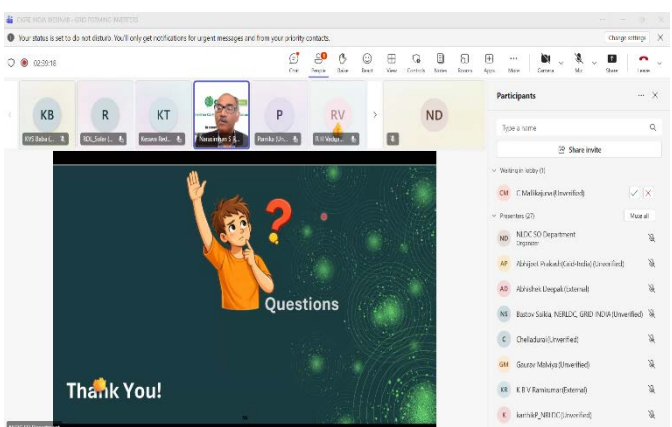
S. No.	Feeding Station Name	RE Complex	Installed RE Capacity on MV (MW Cluster)
1	Farangpali-I	Farangpali	8852
2	Farangpali-II	Farangpali	8852
3	Farangpali-III	Farangpali	8852
4	Bhadra-I	Bhadra	7406
5	Bhadra-II	Bhadra	7406
6	Bhadra-III	Bhadra	7406
7	Bhadra-IV	Bhadra	7406
8	Bhadra-V	Bhadra	7406
9	Bhadra-VI	Bhadra	7406
10	Bhadra-VII	Bhadra	7406
11	Bhadra-VIII	Bhadra	7406
12	Bhadra-IX	Bhadra	7406
13	Bhadra-X	Bhadra	7406
14	Bhadra-XI	Bhadra	7406
15	Bhadra-XII	Bhadra	7406
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18	Bhadra-XV	Bhadra	7406
19	Bhadra-XVI	Bhadra	7406
20	Bhadra-XVII	Bhadra	7406
21	Bhadra-XVIII	Bhadra	7406
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36	Bhadra-XXXIII	Bhadra	7406
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41	Bhadra-XXXVIII	Bhadra	7406
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56	Bhadra-XXXXXIII	Bhadra	7406
57	Bhadra-XXXXXIV	Bhadra	7406
58	Bhadra-XXXXXV	Bhadra	7406
59	Bhadra-XXXXXVI	Bhadra	7406
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100	Bhadra-XXXXXXXVII	Bhadra	7406



**Available Resources to learn more about Grid Forming Inverters**

Participants:

- Waiting in lobby (1)
- Presenters (2)
- NLDC SO Department (Operator)
- Abhishek Prakash (Grid India) (Unverified)
- Abhishek Deepak (External)
- Anirudh Debnath (External)
- Bastar Saha, NERLDC, GRID INDIA (Unverified)
- Chelladurai (Unverified)
- Gaurav Mahapatra (Unverified)
- K. V. Ram Kumar (External)



**Thank You!**

Questions

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- Gaurav Mahapatra (Unverified)
- K. V. Ram Kumar (External)
- Kamran P. M. (Unverified)

**Special Reporter: [Prabhankar Porwal]**  
CIGRE India – SC C2