

Next Generation Network (NGN) Webinars



Grid-Forming E-STATCOM for Renewable Energy and AI Data Center Applications

Summary

The rapid growth of renewable generation and AI data centers is introducing new challenges to power system stability, particularly in weak, low-inertia networks. Grid-forming (GFM) E-STATCOMs are emerging as a flexible solution capable of providing fast active and reactive power support, damping oscillations, improving voltage stability, and enhancing system resilience. This webinar will present recent research and practical design approaches for applying GFM E-STATCOMs in renewable energy systems and large-scale AI data centers. The session will introduce a power-admittance-based modeling framework for analyzing dynamic grid interactions and will demonstrate, through detailed EMT studies, how E-STATCOMs can mitigate sub-synchronous oscillations, load-induced resonance phenomena, flicker, and stability issues associated with rapidly varying loads. The webinar will also discuss how E-STATCOMs can support fault ride-through requirements, improve power quality, reduce the risk of torsional interactions with nearby synchronous generators, and provide a scalable pathway for integrating future renewable generation and AI data center loads into transmission networks.

Speaker

Prabhat Ranjan Bana is a Senior R&D Engineer at Hitachi Energy, Sweden, working on grid-forming control for STATCOM and E-STATCOM systems in renewable-rich and weak-grid applications. He received his PhD in 2023 from the Norwegian University of Science & Technology (NTNU), focusing on advanced control of grid-connected converters. His interests include grid-forming converter control, renewable energy integration, STATCOM/E-STATCOM systems, multilevel converters, and AI/ML-based control design. He has authored over 25 publications and contributed to several patents in power converter technologies and grid-support solutions.

Links & Information

Thursday, October 15, 2026
12 pm CDT | 1 pm EDT

Duration: 1 hour

[Register Here](#)



Prabhat Ranjan Bana

Hitachi Energy, Sweden
Senior R&D Engineer