

Stability and Virtual Inertia in Low-Inertia Power Systems

Outlines:

- Introduction and motivation
- Recent blackouts and low-inertia issue
- Inertia and frequency stability basics
- Challenges of inverter-dominated grids
- Concept of virtual (synthetic) inertia
- Frequency–voltage coupling principle
- Mathematical modeling framework
- IEEE benchmark system examples
- Simulation results and comparisons
- Real-world battery case study
- Impact on grid stability
- Practical challenges and limitations
- Design and coordination aspects
- Key conclusions
- Future outlook



Sunday, 3, February 2026
10:00 am-12:00pm (Riyadh Time)



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