

The Grid Resilience Student Group presents
The IEEE PES President-Elect Candidate

Dr. Bikash Pal



Abstract

Stability Modelling and Analysis of Converter-Driven Power System

The number of power electronics converters in electrical networks is increasing rapidly, as they are integral to all new grid-connected generation. While their fast control and switching enhance operational flexibility, the resulting dynamic interactions can compromise transmission system stability. To address this, it is critical to develop methodologies that identify potential stability and control risks before integrating new converter-based resources such as wind farms, STATCOMs, or HVDC links. This talk presents an impedance-domain analytical framework to quantify interactions between new plants and the existing network. It informs additional specifications for grid connection studies, including detailed technical assessments to mitigate stability risks. The framework supports MMC technology, control delay, system strength, and Fault Ride-Through (FRT) capability. Case studies from the research group of Professor Bikash Pal will illustrate the approach. Future research directions will also be discussed.

Biography

Dr. Bikash Pal is a Professor of Power Systems at Imperial College London, with research expertise in power system stability, control, and estimation. He has led several international research consortia, including UK-China and UK-India collaborations on smart grids, energy storage, and sustainable grid operations. His work is conducted in partnership with industry leaders such as ABB, GE Grid Solutions, and National Grid UK. Dr. Pal is a Fellow of IEEE and the Royal Academy of Engineering, and he received the 2025 IEEE PES Prabha Kundur Award for his contributions to robust control and estimation of power systems. He served as Editor-in-Chief of IEEE Transactions on Sustainable Energy and Vice President of PES Publications. A globally recognized expert, he has trained engineers worldwide and authored over 130 IEEE journal papers and four books on power system modeling, dynamics, and control.



Friday, August 22nd, 2025



12:00 – 1:00 PM (MST)

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