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For a Special Issue on:

Challenges in Future Grid-Interactive Power Converters: Control Strategies, Optimal Operation, and Corrective Actions

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Power grids are expected to reach very significant penetration of power electronics based non-synchronous generation (NSG) i.e. renewable power generation. These grid-interactive power converters are advantageous for energy efficiency improvement, enhanced controllability, integration of renewable energy sources and many other reasons that can significantly enhance the flexibility and controllability of the traditional power system. However, operation of future power systems with these power converters becomes increasingly challenging. One of the primary issues system operators have to confront is the adverse impact of low-inertia on the system stability and operation. Clear evidence has indicated that British and Irish power grids already start to constrain the NSG for stability management due to the lack of system inertia. As such, innovative corrective control schemes for the operation of these power converters under internal faults and external abnormal conditions will pave the path for a smarter, efficient and more reliable power grid. In this Special Issue, we invite original and unpublished submissions on control schemes, optimal operation, economic dispatch, and corrective actions of grid-interactive power converters.

Topics of interest include, but are not limited to:

Control Schemes:

- Design of inertia emulation control and other fast-acting frequency response schemes for NSG.
- Remedial strategies for grid-interactive power converters under internal faults and external abnormal conditions.
- Design of advanced control schemes for low voltage-ride-through capabilities in low-inertia power grids.
- Redundancy including parallel-operation of grid-interactive power converters under abnormal conditions.
- Seamless transition methods between grid-tied and islanding modes.

System Optimal Operation:

- Stability analysis and situational awareness of low-inertia power grids.
- Energy storage integration and solid-state based demand management.
- Optimal system planning, scheduling, and coordination methods for low-inertia grids to enable high NSG-penetrated grid.
- Application of artificial intelligence, machine learning, deep thinking and other paradigms.

Market Design:

- Price settling and optimal procurement for ancillary service markets in consideration of inertia provisions.

Submit your paper to manuscript submission and peer review site via the following link:
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