

The Journal of Engineering

Call for Papers

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Special Issue on:

Engineering Techniques and Technologies to Enhance Power System Resilience

The power industry has witnessed increasingly frequent large-scale outages in recent years, which highlight the necessity of enhancing power system resilience against extreme events including natural disasters and malicious attacks. The COVID-19 pandemic also implies that resilient power systems are more indispensable than ever for modern societies. While this hot topic is motivating researchers to propose different resilience-oriented approaches, their industrial application values are awaiting further investigation. Various technical challenges also remain unaddressed, ranging from power system planning, operation and control, to preparedness, response, restoration and recovery against catastrophic disturbances. Meanwhile, additional flexibility resources provided by diverse emerging smart grid components need to be fully coordinated and utilized for resilience enhancement of both transmission and distribution systems. Interdependencies among the power, natural gas, communications, transportation and potentially other critical infrastructures further necessitate studies on multidisciplinary engineering fields and complicate the practical establishment of resilient power systems. The pandemic is also raising concerns of new threats to power systems, e.g., load profile alteration that potentially increases the peak-valley gap and causes problems of relay settings and voltage management. Innovative models, algorithms, simulation tools and analytical techniques with engineering application potentials are needed to tackle the obstacles. This special issue aims to publish original research, visionary review and case study articles on engineering techniques and technologies to enhance power system resilience against extreme events including the COVID-19 pandemic.

Topics of interest include, but are not limited to:

- Architecture of resilient power systems
- Metrics and methods to quantify power system resilience
- Modelling, simulation and analysis of the impacts of extreme events on power systems
- Situational awareness of power systems before, during, and after extreme events
- Modelling, simulation and analysis of interdependent infrastructures against extreme events
- Big data and machine learning approaches for power system resilience analysis and enhancement
- Identification and mitigation of cascading failures
- Utilization of microgrids, networked microgrids and other emerging smart grid components for resilience enhancement
- Resilience-oriented planning, operation, control and protection of power systems
- Resilience-oriented preparedness and response strategies against extreme events
- Cyber-physical system modelling, analysis and resilience enhancement
- Optimization techniques for power system resilience enhancement
- Rapid service restoration and infrastructure recovery after extreme events

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