Author(s)	Sina Hashemi[1], Mathaios Panteli[1], Balaji V. Venkatasubramanian[1], Pierluigi Mancarella[2]
Affiliation(s)	[1] University of Cyprus, [2] University of Melbourne
Presenting Author	Sina Hashemi
Title of Presentation	Cascading-driven Controlled Islanding for Enhancing the Operational Resilience of Power Grids
Oral or Poster Presentation?	No preference

Summary:

Power systems are exposed to severe disturbances leading to widespread cascading power outages, often initiated by extreme weather and natural hazards. Designing and implementing mitigation strategies against such impactful cascading events is hence an emerging priority to system operators and planners worldwide. Controlled islanding, amongst other solutions as a last resort of mitigation strategies, can effectively inhibit progressive cascading failures and thus prevent power systems from suffering complete blackouts. To this end, contrary to many other existing methods that assume random initiating events for the study of controlled islanding, this work proposes a novel decision-making framework for operational resilience enhancement that seamlessly integrates, for the first time in such studies, a stochastic weather event simulator, an AC cascading failure model and a controlled islanding algorithm. The extent and severity of the initiating events provided by the event simulator are determined by means of the cascading-based resilience analysis to detect and quantify the cascading failure propagation, assisting the efficient decision-making on when and where to apply controlled islanding. The simulation results demonstrate the effectiveness of the proposed work in mitigating the cascading propagation risks following a major disturbance, and a 45.8% improvement, on average, in the served demand across all events modelled (up to N-6 events).