

Resiliency enhancement of the Smart Grid considering time-varying priority of dynamic loads

Resiliency of the power system in the event of natural disasters or cyber-physical threats is greatly challenging. In the aftermath of disasters, damage to the electrical grid can dawdle the recovery effort and perpetuate human suffering. We present a stochastic optimization approach for resilience-oriented-design (ROD) and resilience-oriented-operation (ROO), considering the temporal variation in priority of critical loads. We focus on the management of transmission and distribution systems with objective of transferring maximum power from conventional and distributed energy resources (DERs) to the critical loads. The ROO recommends scheduling of the generators and management plan for loads, to maintain and restore power after a catastrophic event due to natural disaster or a cyberattack.