Optimization of a power-grid islanding algorithm using Monte Carlo simulations IBRAHIM ABOU HAMAD, Florida State University, SVETLANA V. POROSEVA, University of New Mexico, BRETT ISRAELS, PER ARNE RIKVOLD, Florida State University — The purposeful partitioning of a utility system to limit the cascading disturbances is called intelligent intentional islanding. Spectral matrix methods for intelligent intentional islanding of power grids may produce unbalanced clusters of generators and loads when applied recursively. While some of the resulting clusters have surplus generating capacity, others are deficient. To limit cascading power failures by isolating highly connected islands, which are also self-sufficient communities, we use a spectral partitioning algorithm followed by a Monte Carlo optimization procedure to load-balance the communities and increase their internal connectivity or modularity. The resulting network of clusters is treated as a new network and the same spectral and MC procedures are iteratively applied to combine smaller clusters or communities into bigger ones. We show here that the use of this method results in well balanced, internally connected clusters.

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