How long is a resilience event in a transmission system?: Metrics and models driven by utility data

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Tuesday, January 24 • 11:00 AM – Noon (PT) • EME 26

OVERVIEW

We discuss ways to measure duration in a power transmission system resilience event by modeling outage and restore processes from utility data. We introduce novel Poisson process models that describe how resilience events progress and verify that they are typical using extensive outage data collected across North America. Some usual duration metrics show impractically high statistical variability, and we recommend new duration metrics that perform better. Moreover, the Poisson process models have parameters that can be estimated from observed network data under different weather conditions, and are promising new models of typical resilience events. This is joint work with Dr. Svetlana Ekisheva at NERC.

BIO

Dr. Ian Dobson received his BA in Mathematics from Cambridge University and his PhD in Electrical Engineering from Cornell University. He previously worked as an operations analyst in Britain and as a professor for the University of Wisconsin-Madison. He is currently Sandbulte Professor of Electrical and Computer Engineering at Iowa State University. Ian's main interest is applying risk analysis, complex systems, simulation, and nonlinear dynamics to avoid electric power system blackouts. Ian is a fellow of the IEEE.